The Confederate Corps of Engineers

ROBERT R. ELLIS
Lieutenant Colonel, Corps of Engineers

THE cars of the Richmond, Fredericksburg & Potomac Railway ground to a stop in the center of Broad Street under the garish lights of the Station and deposited Edward Porter Alexander, lately Lieutenant, Corps of Engineers, United States Army, within spitting distance of Tom Jefferson's monument to democracy adorning the top of Shockoe Hill, the State House, Richmond, new capital of the Confederacy.

There were no hacks abroad at this unearthly hour but from under station benches Alexander rousted out a pair of sleeping porters to handle his valises. Boneweary, he walked the distance to the Spotswood. At the sight of him and his dusty belongings, the night clerk blew on his nails and advised him that the Spotswood was now the White House of the Confederacy and performed hostel functions only for visitors at cabinet level and ranking dignitaries.

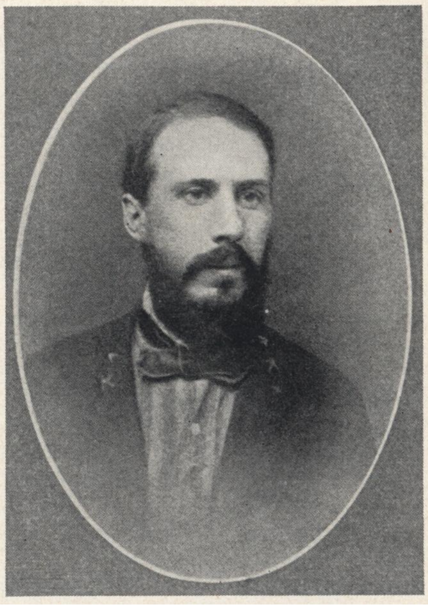
Was the Honorable L. P. Walker, Secretary of War, in his room? The clerk eyed him sharply. No. Secretary Walker was out of the city. Not expected back over the week-end.

Alexander looked through him at the wall beyond and directed that his baggage be conveyed to the Secretary's rooms. He would wait for him there. And see that there was plenty of hot water and a tub—at once.

On point of refusal, the clerk checked himself and surrendered. The young man did have a military look. Knew exactly who he wanted and where to find him. Now-a-days one could never tell. So many gentlemen arrived civilians with the morning and departed generals before night.

ALEXANDER

Of the beginnings of Edward Porter Alexander it is recorded that he came of Georgia stock and cotton money. And, that when his elders sought to conclude whether he should be educated for the bar or the Book, they found that akin to the fighting cocks and blood horses, he had a mind of his own and had set it upon the barrack.


Edward Porter Alexander, 1866

He made his mark at West Point, graduating Number 3, Class of 1857, and immediately was brevetted Second Lieutenant, Corps of Engineers. Before the ink dried on his commission, he was nominated to instruct at the Academy. He was handsome—personable—quickwitted. Albert Sidney Johnston was attracted to him and requested him for the Mormon trouble. General Totten, genial Chief of the Corps, marked him for important work. Contributing largely to the development of the Army's signal system, he received the personal congratulations of the Secretary of War. He was on assignment in the Washington Territory when news came of the secession of his native state and the formation of the Confederacy.

En route home with resignation in his heart, he was intercepted at San Francisco by an Engineer friend, Lieut. James B. McPherson, under instructions from General Totten to dissuade him from his folly. The General's emissary advanced all the arguments why he should not go—promotion, importance, opportunity, money—and warned prophetically of the future of the Confederate States of America. Alexander heard him out, then asked him if under equal circumstances, he could follow his own advice; whereupon, McPherson helped him pack. In Chattanooga he chanced upon the Hon. L. P. Walker, Confederate Secretary of War, who hurried him on to Richmond with a note to the Adjutant General.

RICHMOND—CENTER OF CRISIS

From wells of sleep Alexander started up to the echoes of thundering salutes rattling the window panes, strident martial music, and the ecstatic noises of children squealing after a parade. Making a hasty toilet, he dressed and scrambled out of the hotel.

The street was a litter of Richmond's gorgeous roses. Buildings were swathed in Stars and Bars. State flags were everywhere. Opera bouffé uniforms, varied in design and color, mingled with the shimmering parasols of Richmond's society in a variegated throng. Kentucky — Tennessee — the Carolinas. The Lone Star of Texas—Louisiana's Pelican—Mississippi's Magnolia. White shakoes and gold braid. Pastel crinolines in muslin and lawn. Silk and brocade. Beaver and broadcloth.

Less than a week past the Yankee army had spilled out of Washington to invade Virginia and the whole South was rushing to her rescue. Trains bringing new contingents of saviors puffed hourly into Richmond. The first arrivals had been welcomed and reviewed, but the late-comers were being shunted off unceremoniously northward to the points of danger. The President had hurried to Richmond from Montgomery to meet the crisis. This bright Sunday morning the hero of the hour, the conqueror of Sumter was to leave the city for Manassas, the post of honor, to command the Confederate Army in the coming operation.

Of a long-haired Texan with great rowel spurs Alexander inquired if there were Georgia troops in town. The cavalryman pointed obligingly with a sabre as long as a hay rake, to the flag on the capitol.

"Couple of regiments down thataways. Waitin' for the cars."

In the shade of the Capitol grounds butter-nut militia sprawled at ease and Alexander noted that Georgia's soldiery was somewhat lacking in arms and military discipline. He reckoned, though, as he listened to their chatter, that they were adequate in enthusiasm. He walked among them expectantly and was surprised by their questioning silence, then realized that he was being ridiculous before strangers. Among his own people he was a foreigner. For years the Old Army, not Georgia, had been home. Alexander had a sudden hunger for his own kind and walked quickly back to the station. The feted hero was a fellow soldier, Pierre Gustave Toutant Beauregard, lately Brevet Major and ranking Captain, Corps of Engineers, United States Army.

That afternoon Alexander hired a mount and rode out to see the Army he had come to join. Signs along the road pointed out brigades and divisions by number and volunteer line organizations by state designations. High-flown titles identified some of them and the family names which prefixed various *Guards, Legions, Grays* and *Howitzers* spelled influence and money. Their camps ran in all directions and in brigade after brigade order and police were poor. Regimental areas were cluttered with refuse, and flies rose up in swarms from slaughter pits and latrines. If battle were in the offing, as they all predicted, men by the hundreds who should have been at drill lounged in the company streets.

For hours he rode and questioned without challenge and there was little evidence of *army,* regardless of his route. The lack of uniformity of the regalia of the troops who were at work was disconcerting but the condition of their gear gave him alarm. Of upwards of 40,000 troops he estimated to be scattered about Richmond, only a few were well armed and equipped. Among the batteries it was evident, of all things, that there were not enough horses to draw a full complement of guns, and some of the sections were outfitted with heavy cotton harness. Cavalrymen, apparently, were required to furnish their own mounts. Engineer and service troops were not to be found.

The one business-like operation to be seen was the work going forward on the Richmond fortifications, under the personal supervision, workmen explained, of a General Lee.

He came finally upon an Alabama regiment commanded by a classmate and stayed for supper. Over coffee in the first twilight of the lush spring evening the talk was all of the coming battle, and with the cordials, drifted into politics. President Davis, Alexander discovered, was not altogether a popular man.

A grandfather in a major's uniform rode back with him toward the city. As they flicked along in the starlight, he cautioned Alexander to pay no attention to the gossip, especially about the President. He'd known Jeff Davis quite a time. Served with him in the Old Congress. Regarded him as plain unfortunate. This hell's brew that'd been stirred up for the country was being cooked in a bigger kettle than Davis could carry. What was worse, there wasn't a man in the South could do a better job than Davis, but there were several sure they could. It was just like this army. Couldn't everybody be a general, but there were a heap didn't know it yet. Alexander'd heard the talk. Called themselves an *army!* More like young bucks out on a spree: Going to fight one battle and win a war. Pouf! Just like that. Everybody home by frost. Him, he didn't think so.

Alexander was about to admit that what he had seen that afternoon left something to be desired, but the old Major cut him off.

He'd seen his share of warpaths, and had served with Winfield down in Mexico—they were something of an age, though he'd heard of late that the General could no longer sit a horse—but war'd changed. They had the railroad now, and the telegraph. In New York last winter he'd bought a new-fangled breech loading rifle—worked fine. This war was going to be a killing business. The side with the most on the battlefield at the end was the side that was going to win—winner take all. On a long haul, that'd take a heap of unity, and in spite of all the talk they'd listened to that evening, the South plain didn't grow that staple. Had Alexander looked carefully at the equipment? Noticed the weapons? Well, when the trouble'd started there'd been almost a half-million small arms, and nobody knew how many cannon or how much equipment, scattered about the South in State and Federal arsenals. Where was it now? The States'd kept it. With the first big campaign staring them in the face, they'd sent their best blood to fight it empty handed—Georgia'd sent hers nearly naked. No, when it came down to personal interest, the Confederate Government they'd manufactured down at Montgomery — and which they were—could shift for itself.

They rode along pensively for a few minutes before the old gentleman broke the silence. Mr. Davis had a fine legal mind—one of the finest. He was a natural for litigation. Too bad this mess couldn't be settled by a law suit.

Above the city rose up a baleful glow. Furnaces of the Tredegar Iron works, explained the Major, one of the sights of Richmond—not to be missed. Owned by a Mr. Joseph Anderson—very efficient man—West Pointer, also. If Alexander'd just stop in there on the way back to the Spotswood, he could watch them melting down good railroad iron to make cannon balls. He'd pass by the arsenal, too, that way in. Could drop in there and watch them loading their cannon powder into musket cartridges. Most impressive sights.

To directions and wishes for a pleasant evening, he added a reminder for Alexander not to be too critical of the President, and just to hope his own lot wouldn't be as unhappy. Him, he was away too old for this business. Was going home where he belonged.

DUAL MILITARY ASSIGNMENTS

Out bright and early the next morning, Alexander asked unwittingly of a partisan of the city as to the location of the government offices and was hotly informed that they were everywhere. By God, Sir! Just everywhere. They'd moved right in and moved Richmond right out. Even Tom Jefferson's Capitol, Sir! At last accounts Mr. President Davis, the State Department and the Treasury had taken over the Customs House. Lord only knew who had the Court House and the Post Office. And the War Department might be found at the Mechanics Institute. That is, Sir, if the vandals hadn't taken it down and carted it away, brick by brick, over the weekend!

If there was noise of complaint over the allocation of Richmond's finest to the Confederate parvenues, Alexander was convinced that in the Mechanics Institute could be found bedlam enough to drown it out. The building literally vibrated to the raucous fury of saw and hammer as its library and classrooms were partitioned off into offices and cubbyholes for a myriad of clerks and adjutants clambering frantically to protect their precious papers from sawdust and falling plaster. It was pointless to ask directions and he probed about the building, hunting General Cooper by sight.

On the top floor he stumbled into the offices of General Robert E. Lee and his staff. Colonel Garnett, Lee's executive, he knew personally and there was welcome, introduction, and inquiry after old friends all around. They accepted Alexander's presence as evidence of his intentions, and when he showed them Secretary Walker's letter, escorted him in a body to one of the quieter alcoves where Adjutant General Cooper kept office. Before the workmen quit for lunch, he was sworn into the Confederate States Army as Captain, Corps of Engineers, and presented to Col. Josiah P. Gorgas, Chief of the Engineer Bureau.

Colonel Gorgas, Alexander recalled, had been associated with the Artillery, particularly the Ordnance reaches thereof. Though he knew only well of him, Alexander was chagrined to find a cannoneer enshrined as Chief of Engineers. And he was not made happier. After brusque formalities and preliminaries, Colonel Gorgas assigned him a mission—his pet project. Of several of the independent batteries about the city, Alexander would form a provisional artillery battalion, secure its equipment, prepare its doctrine, and supervise its training.

Captain Alexander outfitted that afternoon with a full supply of fine gray cashmeres at Kent, Penick & Company, and acquired a pair of French artillery glasses at J. W. Randolph's on Main Street. Returning to the Spotswood to go into uniform, he received a profuse welcome from the clerk who had first greeted him with indifference. Bustling with importance, he advised Alexander that Mr. Secretary Walker had returned. Accommodations for Mr. Walker's friend had been found right across from the Secretary. The effects had already been transferred. The management trusted he would be comfortable. With an air of climax he reached into his coat and produced a handsomely engraved envelope.

The President of the Confederate States of America wished to see Captain Alexander at once.

The President remembered him well. If the years which had intervened since the signal experiments had hardened the lines about the President's eyes and mouth, it was Alexander's instant opinion that they had detracted not a whit from his graciousness. There was a deal of small talk in which Mr. Davis made it plain that he envied the younger officers — especially those both popular and brilliant. Colonel Garnett of Lee's staff was being promoted and would have a command in the field and General Lee had mentioned the requirement for a young Engineer of competence—as had Gen. Albert Sidney Johnston who was assuming command on the Kentucky frontier. Then the President was all business. He was being forced to deny these petitions in order to promote larger works. There was immediate need for the development of a signal system for the armies in the field, for the training of signal personnel, and for the establishment in Richmond of a factory to produce signal equipment. For such responsibility there was no man in the Confederacy more ably suited than Captain Alexander. Before Alexander could protest the compliment or inform the President that the Chief of Engineers had already claimed his services, Mr. Davis wished him well and bade him good-night.

To Captain Alexander's account of his visit with the President, Colonel Gorgas listened with a good many *harrumphs*. He was already Chief of Ordnance as well as Chief of Engineers and he had no desire to add the responsibilities of Chief Signal Officer to his burdens. In tones heavy with chain-of-command, he instructed Captain Alexander to proceed at once with the artillery business. In the meantime, he would speak with Secretary Walker and get the President straightened out on these signal matters. One other thing: Before he had been in the Confederate Army more than a day, he, too, had been received by the President—and had come away with a directive to organize over the South factories and arsenals for the production of weapons and the munitions of war.

Caught in a cross-fire of orders he could not question, Alexander carried water on both shoulders. The battalion was formed, equipment secured, and classes of instruction organized for both officers and noncommissioned personnel. A building was secured, the railway companies prevailed upon to lend a few specialists, and shortly a factory turned out torches, poles, flags and a miscellany of signal equipment. In these operations the harried Captain found the Confederate War Department as enmeshed in red tape as if it had been in existence a hundred years.

In due course, Secretary Walker conveyed to the President the views of the Chief of Engineers and Ordnance on signal matters. Before sundown of that day Captain Alexander was en route to Manassas—to install a system of signals for the coming battle. Beauregard received him kindly and assigned him to his staff. In his blood-hound eyes there was no trace of resentment at the presidential interference. If the President wanted signals, let there be a multitude. Besides—he was busy with strategy.

Alexander applied himself with diligence. Equipment came up from Richmond. Volunteers were screened and training begun. The area around Manassas and the Junction was explored thoroughly for facilities for lines of signals. Towers went up and trainees flagged industriously. Beauregard was plagued by farmers with reports of mysterious lights seen at all hours of the night.

BLOODSHED AT MANASSAS

Around the middle of July great clouds of dust rose up to the north of Centreville and a few mornings later the frantic wig-wagging of the semiphores was not practice. In the vicinity of one of the crossings on Bull Run Creek, Blackburn's Ford, held by a Virginia brigade under Alexander's fellow Georgian and old paymaster, Gen. James Longstreet, artillery erupted into action. Confusion, black as night, settled like a blanket over northern Virginia.

Richmond gravitated to the un-official seat of government—the Spotswood. High functionaries came in early driblets with the first hint of action and became a crowd, growing all the morning. All the afternoon. Into the night. They packed the lobby, filled the bar, spilled out onto the sidewalk, flowed over the street. Through rumor after rumor of defeat and disaster they stood bleary eyed and impassive, the glitter and romance of war vanishing in its first reality. In the small hours of the morning came the President's official message: A great victory, but at terrible cost.

The day following First Manassas—July 21, 1861—the Gray Army had a little time for sober reflection. For them it was a dreary day and rainy, so that pursuit was halted and consideration given to the slain. As the burial parties went about their unhappy work, nervous privates assembled unspeakable matters from the litter of the battlefield. Water trickled into the open graves, spattering with red Virginia mud the incredulous faces of the dead. Something was amiss, nothing a man could put his finger on, but the air was full of it—and this personal killing was not part of the war they had come to fight.

Dummy Guns—Deceptive Devices at Centreville

And the Gray outposts overlooking the Yankee Capital from the Virginia hills above the Potomac were not altogether easy in their minds. The battle they had come to fight had been won, but there were no flags of truce coming out from Washington with overtures for surrender. All day Blue troops marched and countermarched on the flats along the river and that night defiantly removed the decking from the bridges.

For the military heroes the Southern press prepared the laurel wreath, and for Jefferson Davis, a crown of thorns. They visited upon him failure to capture Washington, an act, in their eyes, just under treason. Unconsciously, the whole South began to gird itself for war.

THE SOUTH GIRDS FOR WAR

Overnight the Confederate War Department was swamped with demands for services which only Engineers could render. To establish order where there had been confusion and give emphasis where there had been neglect, President Davis called to be Chief of Engineers, Maj. Danville Leadbetter. He was a distinguished graduate of the Academy and had a long career of military and civil achievement behind him. He had resigned from the Army in 1857 to become Chief Engineer of Alabama and was something of a factor in the politics of that state. In some circles he was regarded with suspicion, being a bluenose born and bred in Maine. Among the well-informed he was a recognized authority on seacoast fortifications who had personally accomplished much of the engineering on the defenses of Mobile. To Alexander he was of a company with his venerable companion of the return to Richmond after his inspection of the army.

Defensive works to be prepared for thousands of miles of coast line, and the rambling Southern frontiers—an embryonic railroad system which must be stretched into a network connecting the centers of commerce, industry, and population—demands by the tons for maps which were non-existent beyond such sketchy outlines as had been prepared by the Coast Survey, and a few scattered interior sections—provisions to be made for direct Engineer support of field operations—these and a hundred pressing and related matters confused and demoralized the new Chief. For the moment his most urgent need was human resources, trained material adequately to supervise all of these undertakings.

Captain Alexander, directed to prepare a plan for the Chief, went straight to the heart of the problem. Of the Old Corps of Engineers and Topographic Engineers, which together numbered less than a hundred officers, thirteen had resigned in the crisis. Twelve had joined the Confederacy. With the shortage of competent command and staff personnel in the combat forces, the Chief of Engineers would be fortunate, indeed, if half of these were made available to him. Into the legal constitution of the Corps, Alexander inquired minutely: One colonel; one lieutenant colonel; four majors; eleven captains; two first lieutenants; one second lieutenant; and two companies of sappers, miners and bombardiers not to exceed an enlisted strength of one hundred men each. The demands of a country preparing for war—a defensive war according to the President—called for Engineer officers, troops and artisans by the thousands. Physically, they were to be had throughout the South by the hundreds. The Corps of Engineers which the Congress proposed, and the President approved, provided them by the tens.

Field Fortifications at Centreville, 1861

This article will be continued in consecutive issues.

The Confederate Corps of Engineers. Part II*

ROBERT R. ELLIS
Lieutenant Colonel, Corps of Engineers

TO Capt. Edward Porter Alexander, working hurriedly (in the first flurry of Confederate organization following the Union disaster at Manassas in July 1861) to put together an adequate staff for the Office of the Chief of Engineers in Richmond, the problem did not seem insurmountable. It was true that, overnight, the War Department had been swamped with demands for services which only engineers could render and it was equally true that no engineer organization existed with which to meet them. But he did have a point of beginning—legal basis for a Corps of Engineers had been established and there were human resources upon which to draw for its creation.

CONFEDERATE REQUIREMENTS FOR ENGINEER SERVICES

The requirements around which he must plan an organization were impressive, but in the light of his own logic they were not frightening. First, there were the frontiers to be considered. The coast line rambled for some 2,000 miles beginning roughly at Norfolk in the Chesapeake Bay region, tracing out the Atlantic Seaboard around the Florida Peninsula, and across the Gulf to Brownsville on the far tip of Texas —a line broken by hundreds of inlets, bays, and coastal rivers opening the interior to enemy penetration. The land frontier originated up on the Pennsylvania-Ohio boundary opposite Pittsburgh, followed the line of the Ohio River and Virginia to Tennessee, then stretched west across Arkansas and Texas to the Mexican border. While together they added up to some 4,000 miles for defensive measures, logistical factors weighed heavily in favor of the Confederacy. President Lincoln had declared a naval blockade of the entire South, but he had not the means to enforce it or to support an invasion of any magnitude based on supply by water transport. For the moment, as far as the coastal area was concerned, only the major ports were critical—Norfolk, Wilmington, Charleston, Savannah, Jacksonville, Pensacola, Mobile, New Orleans, and Galveston. And, though the land frontier could be breached at will, the same restrictions of transport and supply denied enemy consideration of more than three general areas; the approaches to Richmond, the approaches to Chattanooga, and the gateway to the southern Mississippi Valley. Internally there were two fundamental problems; to tie together the South's sketchy and disjointed railway system—a series of projects representing construction effort of enormous proportions, and river and harbor work to keep open the inland waterways which were an integral part of the South's communication system. Provision must also be made for the preparation and distribution of the thousands of maps which were in instant demand, and for direct engineer support of military operations.

Throughout the Confederacy, Alexander reasoned, individuals and local governments were doing all within their resources and abilities to prepare for the war. Independently, engineering work of one form or another related to the basic requirements would be going forward everywhere. The thing to do was get it organized, tie it together—make it count. Late though it might be, if judicious use were made of both men and materials, if there were concentration and co-ordination of effort, much could be accomplished. To effect all of this, direct authority existed for a Corps of Engineers of twenty officers and two hundred men; however, by liberal interpretation of existing law, there was indirect authority for whatever force the President might deem necessary. The key to the organizational problem, as he saw it, was to set up in the Office of the Chief of Engineers functional staff sections to provide supervision of the various types of work to be accomplished, and, from there expand to a normal system of area control—Engineer Districts—and management for special projects. The first step was to have the right people assigned to duty in the Office of the Chief of Engineers.

HUMAN RESOURCES

To the building of the Union, the Old Engineer components, Civil and Topographic, had contributed a major share, and much of the best over-all talent available to the South had seen service in these corps. A sizable percentage of the officer personnel of the Old Army, not assigned directly to the Corps but possessed of engineer qualifications, came from Southern states and many had followed them into secession. In addition, there were former Engineer officers of prominence in the North who had sided with the South. Robert E. Lee, Lieutenant Colonel of United States Cavalry, was a Brevet Colonel of Engineers. Joseph E. Johnston, Quartermaster General of the United States Army, had a long record of distinguished service with the Topographic Corps. Gustavus W. Smith, a commissioner of the City of New York, had been twice brevetted as an Engineer officer in the Mexican War. George W. Rains, a pioneer in the eastern steel industry, was an Engineer Major by brevet and had once taught engineering at the Military Academy. In the South, as well, there were former Engineer officers of reputation who had offered their services. Andrew Talcott, Chief Engineer of the State of Virginia, was as well known in civil life as an authority on railroad construction as he was among the military for his work on fortifications. Danville Leadbetter, Chief Engineer of the State of Alabama, a recognized voice on seacoast defense, was presently Chief of the Confederate Corps. Resignations directly from the Engineer services of the Old Army provided a wealth of talent in quality if not in quantity. Known at the moment to have entered military service in the South were these. From the Corps of Engineers: P. G. T. Beauregard, Captain and Brevet Major, Number 2, Class of 1838, of Louisiana; Jeremy F. Gilmer, Captain, Number 4, Class of 1839, of North Carolina; William H. C. Whiting, Captain, Number 1, Class of 1845 and the most brilliant student which the Academy had produced, of Mississippi; George W. C. Lee,

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First Lieutenant, Number 1, Class of 1854, of Virginia; Richard K. Meade, Jr., Second Lieutenant, Number 2, Class of 1857, of Virginia; Edward Porter Alexander, Second Lieutenant, Number 3, Class of 1857, of Georgia; Samuel H. Lockett, Brevet Second Lieutenant, Number 2, Class of 1859, of Alabama. From the Corps of Topographic Engineers: Martin L. Smith, Captain, Number 16, Class of 1842, of New York; William P. Smith, Brevet Second Lieutenant, Number 9, Class of 1857, of Virginia; Joseph Dixon, Brevet Second Lieutenant, Number 3, Class of 1858, of Tennessee; William H. Echols, Brevet Second Lieutenant, Number 4, Class of 1858, of Alabama; Charles R. Collins, Brevet Second Lieutenant, Number 3, Class of 1859, of Pennsylvania; Robert F. Beckham, Brevet Second Lieutenant, Number 6, Class of 1859, of Virginia.

Robert E. Lee, Johnston, Beauregard, Gustavus Smith, and Whiting, he knew, were already general officers, and while they might lend their prestige to engineer effort or occasionally render personal supervision and assistance on specific projects, from the standpoint of Corps organization they could not be considered. As for the remainder, to obtain information as to their whereabouts and status entailed another visit to the War Department and an encounter with the Army's personnel system, a prospect he did not relish. He had passed that way before.

At his first question, an ageing watery-eyed chief clerk called up a battery of assistants. The President, explained the old man half in apology, half in warning, took right much interest in the West Pointers. Handled most of their assignments himself. But they'd do what they could. Yes, sir. While he talked, Alexander wrote him off for what he was. His assistants, however, looked mighty young and vigorous to be civilian clerks in an adjutant's office.

They huddled over his list and for upwards of two hours haggled and bickered among themselves, running back and forth comparing extracts and correspondence, in the end completely confusing Alexander with their efforts. They spoke of Engineer officers who had been appointed in the Corps and detailed out, of others who had been appointed out and detailed in, rattling off names of which he had never heard and describing men he could not possibly identify. They were positive this one was and that one wasn't, though the orders were not available, just at the moment, to establish either case. In the end they produced, with obvious satisfaction, a list of definite appointments which contained seven names: Maj. Danville Leadbetter, Capt. William Boggs, Capt. G. W. C. Lee, Capt. W. H. Stevens, Capt. E. P. Alexander, Capt. S. H. Lockett, and Capt. W. H. Echols. Of these, Captain Boggs, on last account, was reported to be at Pensacola with General Bragg; Captain Lee was on staff detail, presumably with the President; Captain Stevens might be with General Johnston; Captain Lockett was somewhere in the west; Captain Echols was in South Carolina; Major Leadbetter was on engineer duty in Richmond. The last notation, Alexander could hardly credit—he was listed as assigned to General Johnston.

Certainly, a country being organized from the ground up, Alexander reckoned, would experience difficulties and this one, being born in a war, was having more than a fair share. Allowances could be made in all directions, even the War Department, on that score. The problem with which he was trying to cope was by no means the most important confronting the Confederacy; he had no illusions on that point. But it was true that a successful solution to the engineer problem would have a definite bearing on the outcome of Confederate affairs generally. Strategically, and tactically, it had to be solved. Should he acquaint Major Leadbetter with his findings and suggest a conference with the Secretary of War? He did not wish to appear presumptuous; yet, if anything was to be done to make available the personnel to accomplish the engineer mission, it would have to be on the basis of Presidential intervention. Suppose the Secretary agreed, what of the reported rift between the President and Mr. Walker? Would the request for special consideration at this time produce a reaction unfavorable to the Corps? On the other hand, the President was the most experienced man in the South on military affairs. It was reasonably safe to assume that already he was fully aware of the situation. Granting that the solution of the engineer problem was critical to Confederate success, and there existed for the President the authority and the means with which to effect a solution, why had he made no real effort in this direction?

Alexander started back to his lodgings considerably disturbed of mind. The phrases—"organization," "co-ordination," "concentration," "judicious use of men and materials"—kept running through his head and they carried a connotation of unity of effort which nowhere could he find expressed in physical form. Not only were there apparent voids in high places, but on the night before the action at Manassas, the employees of the railroad refused to operate the trains to bring up supporting troops. A prophecy to which he had listened in the engineer barracks in San Francisco, had heard repeated in the Confederate lines above Richmond, began to gnaw at his memory—and his confidence. Both McPherson and the Major had been right. Secession was a pretty satisfying philosophy until one came to apply it, then it had no constancy; it was a thing all of shades and degrees, productive of discord rather than harmony. And above the heads of the great and near great of the Confederacy, to his way of thinking, there was too much of an aura of *my personal dignity requires*.

Of the President, Alexander had never been critical. In fact he had been warned dead-against listening to rumors concerning the deficiencies of Jefferson Davis. But of late a story was making the rounds which he could not ignore. It came from a source too close. Winfield Scott's reaction to the Confederacy's choice for President was shocking. "I am amazed," the old general was reported to have said, "that any man of judgment should hope for the success of any cause in which Jefferson Davis is a leader. There is contamination in his touch. If secession was 'the holiest cause that tongue or sword of mortal ever lost or gained,' he would ruin it! He will bear a great deal of watching. He is not a cheap Judas. I do not think he would have sold the Saviour for thirty shillings, but for the successorship of Pontius Pilate he would have betrayed Christ and the Apostles and the whole Christian Church." Hard words, those.

A NEW ASSIGNMENT

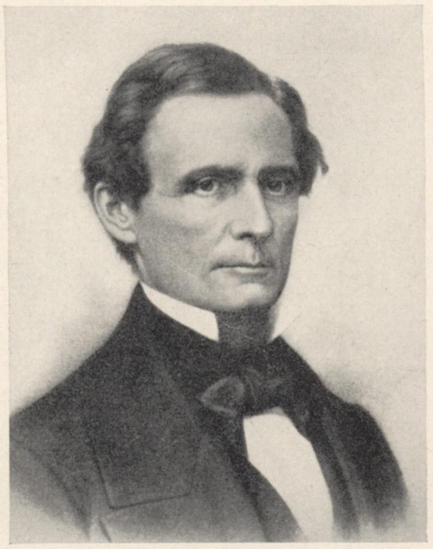
The more Alexander thought of his problem, the more he hated it. Not because he could not solve it, but because the knowledge was upon him that there would never be an opportunity for him to try. Almost, he wished, that he had nothing to do with it. He made a mental note that in July heat, the coat he had purchased at Kent's was too tight in the chest and throat.

As he plodded along in the dust, he became conscious of a name being called out above the noise of the street and came to a startled halt when he realized that it was his. An officer whom he identified as one of Beauregard's aides hurried to catch up with him.

He must return to the Junction at once. Bluebellies from every nook and cranny in Yankeeland were pouring into Washington. Sure to be another ruckus. Beauregard had appointed him, Alexander, Ordnance Officer for his own command, but Johnston had intervened and made him Chief of Ordnance for the whole Army. Wanted him to organize an ordnance train, right now. And in case he had not heard, he was *Major* Alexander. That was that.

Alexander wasted no time trying to buy stars to replace the three bars on his collar, neither did he bother to exchange formalities with Colonel Gorgas, a dubious pleasure he felt he could forego, but quickly apprised Major Leadbetter of events and set out for Manassas.

Major Alexander—now that did have a sound to it—and Chief of Ordnance to General Johnston! Who could tell? Maybe, someday, there would be three stars—and a wreath to go around them. General Alexander! After all, Whiting had made it. The war welled up within him, a thing of drums, and banners, and marching men, as it is apt to do when men are young in it. And it was good to be free of his burden. But was he free? Out of his daydream rose the rambling, broken seacoast, the long unguarded frontier, the railroads to be built, and the maps. Where would the engineers ever get all those maps? That was a good question. Where would he get *his* maps?


Jefferson Davis

THE CORPS GETS A NEW CHIEF

The Autumn of 1861 in the Confederacy's capital was fine and long and the sense of security and prosperity which prevailed throughout the South was reflected in the complacency of the Provisional Congress which assembled in November. And the people who crowded the galleries at the beginning of the session expecting excitement went home disappointed. There was plenty of *ambre* and considerable oratory, but little action. The enemy was far away and the victory at Leesburg had been taken as general confirmation of what had been established at Manassas: The Confederate States of America could not be overwhelmed by force of arms. The real danger had passed. There was now only to wait for Victoria's intervention. Napoleon would quickly follow suit. These were actions anticipated daily. Mr. Lincoln was somehow finding ships to enforce his blockade and the flow of Southern cotton to English mills was beginning to peter out. Military matters ceased to be of burning public interest. In fact, so little interest was there in military affairs, that there were few to note that on November 13 the benumbed Maj. Danville Leadbetter relinquished the Office of the Chief of Engineers to Capt. Alfred L. Rives and returned to the business of fortifications.

Rives was gentry. In the elite circles of a society based entirely on pedigree, he could, and did, take his ease in the most exclusive drawing rooms. His father was a former United States Senator, a man of parts and attainments. But he need not rely on his father's reputation, though it might help in dealing with the elder generation which dominated Confederate politics. Professionally he was competent, immensely practical, and his opinions were respected. In the Southern engineering fraternity (the men who had been carrying on the major enterprises at the outbreak of the war) he was well liked. Among the rising younger military of the Provisional Army—such men as Robert E. Roads, Keith Boswell, George Dickerson, B. L. Blackford—he counted endless friendships. In all respects, his was an ideal choice, but in the eyes of the President he had a serious flaw. He was an honor graduate of the Military Institute of Virginia, not the Military Academy of the United States. His appointment was only as "acting" Chief of Engineers.

The President's new Secretary of War might exhibit a bland interest in the social heritage and qualifications of Captain Rives, or none at all, it would depend entirely on how he felt at the moment. Capital society would act formally soon to accept the new cabinet member or to reject him. Had it but known, it could have spared itself the effort. Upon the body of Judah P. Benjamin, the Almighty had visited all the physical characteristics of his race, his mind He had endowed with all its brilliance. Benjamin lived in a world of capacities and capabilities the majority of his associates could never hope to enter. What they thought of him, he did not particularly care. He was facile of judgment, an easy worker, rapid in his mastery of facts and conclusions. Suave, he was perhaps over-courteous, and the facial expression he wore as a perpetual mask was certainly not a smirk, yet it was never a smile. He could not be depressed, and among the more serious and determined of the President's associates he was distrusted. He was intensely loyal, both to himself and to the President. But his greatest offense was not his blood or his attitude. It was his competence. Too, he loved luxury and he had the means to indulge both his desires and his indifference. Yet, he was not a snob. Indeed, he was far more indulgent, understanding, and tolerant with tardy officials and contentious generals than they ever realized.

There was to his personality another facet on which the President himself was best qualified to give testimony. There had been a day in the Old Congress when the Honorable Jefferson Davis had taken the floor of the Senate verbally to flay the hide right off the back of the Senator from Louisiana and had been given instant opportunity to revise his opinions, over the sights of a dueling pistol. Judah P. Benjamin might yield in an argument, but it would be on the basis of conviction. No man could scare him.

Insofar as he was able, Benjamin gave his Acting Chief of Engineers a free hand and asked only for results.

At the end of six weeks, clerks in The Adjutant General's Office stared in open faced disbelief at an administrative nightmare no one would ever be able to untangle. As nearly as they could reconstruct events, when Captain Rives took office he had set up a personal Adjutant General's department, and turned it into a day and night recruiting bureau with no more instructions than "seek and ye shall find." They had left a trail from one end of the Confederacy to the other. Apparently there was no limit to the number of civilian engineers who had been appointed Second Lieutenants in the line of the Army on the spot and promoted within the hour to whatever grade in the Provisional Army Captain Rives felt they should have. And what of all these people addressed as "Captain" and "Lieutenant" with no shred of authority for their appointments. One case they reserved for the personal attention of General Cooper—an Assistant Engineer with three stars serving under a Chief Engineer whose collar boasted only two. And the Adjutant General's toes were not the only ones trod upon. There were yowls of anguish from all sides.

Judah P. Benjamin

But in the field engineer business was humming. A territorial organization corresponding to the military subdivisions of the Confederacy had been established and a Department Engineer appointed and given jurisdiction over all engineer work within his area. Federal, state, or local, the Confederate Corps absorbed it on the spot.

The floating equipment of the United States Engineer Department in Southern waters had fallen into the hands of the several seceding states. Partly by persuasion, partly by seduction, and partly by action protested as outright piracy, it found its way into the possession of Mr. Benjamin's Acting Chief Engineer.

The problem of the railroads had received early attention. A partial net was already in existence and more had been under construction at the outbreak of the war. What was desired was a continuous trunk line extending from Virginia to Texas. The skips were located in Alabama, Louisiana, the Carolinas, and Virginia. For years the Virginia Military Institute had been furnishing the bulk of the engineers engaged in railroad construction in the South and Southwest. Most of these men Rives knew personally and he contributed largely to a plan whereby the railroads themselves, with government assistance, were to carry out the necessary construction, the Corps holding the purse strings.

For general supervision of all construction, a Construction Section was added to the Office to go along with the "Recruiting Bureau." Almost at once it became apparent that iron would soon disappear from the market and another section was included. The Corps went into the mining and smelting business. And they did not stop there. Plans for engineer workshops for the manufacture of tools, wheelbarrows, axes, shovels and other engineer items, were laid out for establishment in a number of Southern cities and the work was begun.

An active topographic program was undertaken at Department level. Drafting sections were established and survey parties were put into the field. Efforts, mostly futile, were made to obtain and supply the maps called for by the Armies. To overcome the laborious process of map reproduction by the line engraving method they began to experiment with reproduction by photographic processes.

Incidental to the preparation of the Secretary's annual report to the Congress, Mr. Benjamin, before the first of the year, reviewed the Engineer situation in detail with the Acting Chief, weighed the din of complaints over his activities against their results; and recommended him for promotion. In his report to the Congress, however, the Secretary complained bitterly of the paucity of Engineer officers, recounted in detail the various expedients to which he had been obliged to resort to supply the deficiency, and made recommendations for elaborate augmentations. In the end, the Congress cut it back to about where he figured—sufficient vacancies to absorb the past activities of the "Recruiting Bureau" and $134,000 to cover the operations of the "Supply Section." They could face the new year, he thought, in pretty fair shape.

A NEW CONCEPT IN ORGANIZATION

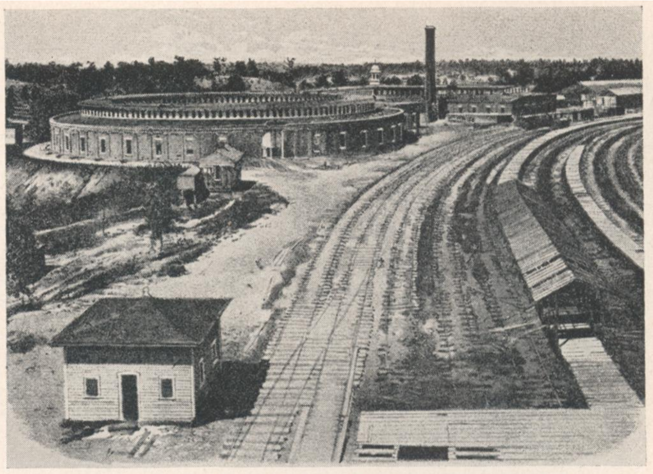
For the Acting Chief Engineer the moment had arrived to broach an idea he had been saving for just such an occasion. Could he have a few moments of the Secretary's time to show him a map?

Most of the mountains, he explained, and all of the rivers in the Confederacy ran in the wrong direction—up and down rather than across so that they were never barriers but avenues of approach—and the railroads were all in the wrong location. There were three places where an aggressive and alert enemy could compound these peculiarities into a lot of trouble for the War Department in a hurry.

In the East, Virginia—Richmond—was particularly weak defensively. All along the northern and western frontier was the Ohio River, a natural avenue of approach from the heart of the North. All along the eastern frontier were the Potomac River and the Chesapeake Bay with arms—the Rappahannock, York and James—penetrating to the front steps of the Capitol.

Farther west—Chattanooga—was the second place to watch. Would the Secretary take a good look at those railroads? All main east-west lines in the North tied in at Cincinnati. The best road in the whole

Blockhouse for Defense of Railroad Yard, Chattanooga, Tennessee

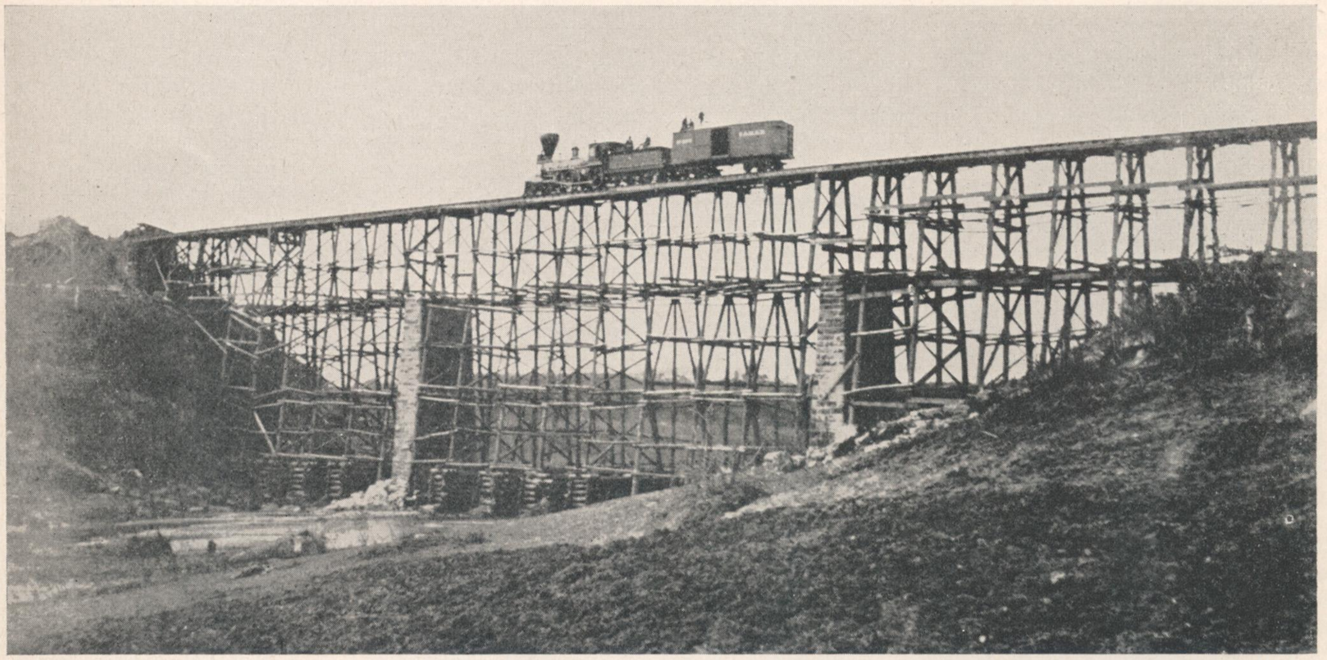

Roundhouse at Atlanta, Georgia

country ran into Chattanooga from Cincinnati by way of Louisville and Nashville. And there had been a good water route into Chattanooga out of the North long before anybody ever thought of railroads. From Chattanooga south, the railroad ran to Atlanta and from Atlanta to the sea—to Charleston by way of Augusta—to Savannah by way of Macon—to Mobile by way of Montgomery. If an invading army under a good commander ever beat its way into Chattanooga and got a strangle hold on that railroad system, they could pull the heart right out of secession.

But the most critical area was the Cumberland-Tennessee-Mississippi River gateway to the lower Mississippi Valley. Let the enemy in here and not only would he be on the water route to Chattanooga, but on the Mississippi there would be no stopping him north of Memphis—maybe Vicksburg.

There were plenty of Engineer officers in the Army, though they might not be on engineer duty at the moment, who could be spared long enough to construct defensive works in these areas. What was missing was ability on the supervisory level to carry out their plans and instructions. The Secretary would recall that the Congress had authorized two engineer companies of one hundred men each which had never been constituted. Now was the time to do it. Fill them to the brim with construction men. The "Recruiting Bureau" could take care of that in short order. Under the companies they would set up labor troops. The basic unit would be a gang, one hundred negroes under a Manager and two Overseers; eight gangs to a section under a Superintendent and a small staff; four sections for a force under a Director and a staff; four forces to an engineer company. True, it was not all that was needed but it was about as far as he felt he could go with only two engineer companies to work with.

It was, allowed the Secretary, about the nearest thing he'd ever seen to the loaves and fishes in flesh and blood. Let's see now, two divisions out of two companies. Most remarkable. The President would likely think the negro business bad politics. Old Joe Brown down in Georgia would have a stroke, no less. There'd be some congressmen who wouldn't like it either. But it would be fun to see the furor. He reckoned they'd give it a try.


Wooden Trestle over Potomac Creek

The Confederate Corps of Engineers—Part III*

ROBERT R. ELLIS

Lieutenant Colonel, Corps of Engineers

SECRETARY BENJAMIN presented Rives' plan for the activation of two colored labor service forces to provide desperately needed Engineer construction units in the field to President Davis, a man long practiced in listening with studied patience but with singular lack of enthusiasm to any idea save his own. To be sure, Captain Rives was to be complimented for his industry. This proposal, however, would seem to confirm reports indicating a lack of diplomatic adroitness. It would never do politically.

There were other considerations, Benjamin countered, and he pushed on with the Engineer evaluation of the gateways to the Confederacy: how Richmond—with the Ohio River providing a natural approach into Virginia from the north and west, and the arms of the Chesapeake penetrating almost to the Capitol steps from the south and east—was particularly weak defensively; how an invading army under a good commander, if they could ever beat their way into Chattanooga, could pull the heart right out of secession. He dwelt at length on the Cumberland-Tennessee-Mississippi River gateway to the lower Mississippi Valley. Not only would a breakthrough here force the evacuation of Nashville and open the water route to Chattanooga, it could split the Confederacy wide open. If the enemy got past Fort Donelson on the Cumberland, there would be no stopping him north of Memphis, or Vicksburg, perhaps. And the next stronghold was New Orleans. His heart was in the task but as he warmed to his subject, the atmosphere of the Presidential chambers became frigid.

Measures affecting such considerations, the President reminded him, were the responsibility of the Commander-in-Chief and the Army commander in the field, not the Office of the Chief of Engineers.

That, asserted the Secretary, depended on the point of view. There were those who placed governmental liability on a basis not so exclusive. Definitely, there was one item on which Engineer advice could be well taken. Fort Donelson had been laid out, as had most other Confederate works, with more emphasis on size than on tactical or strategic considerations. As the President well knew, there were neither guns nor men sufficient to defend any of them.

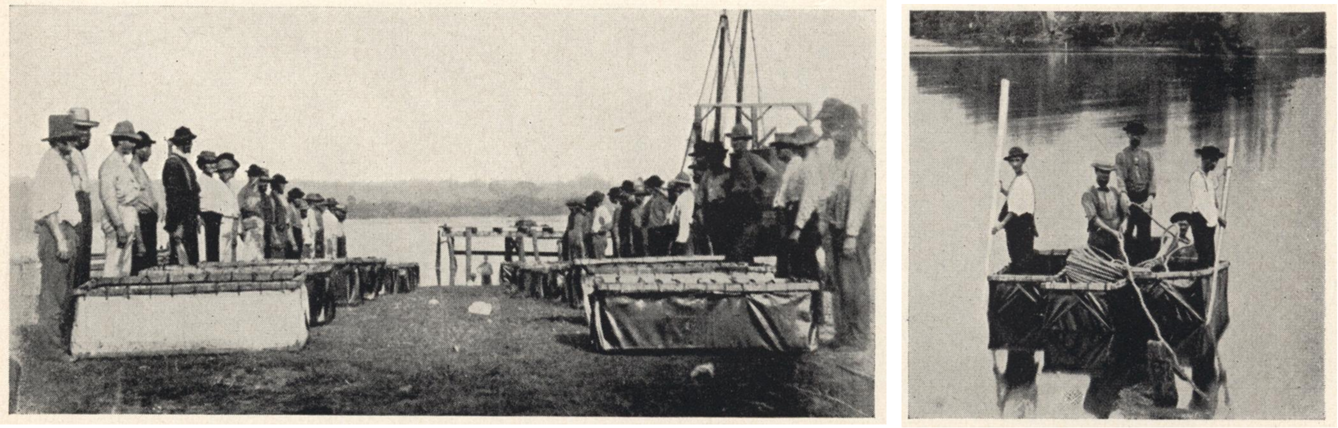
In the immediate area, the President assured him, were men fully equal to the situation. Albert Johnston exercised field command. Did Mr. Benjamin have any quarrel with his abilities? In addition, there were such generals as John B. Floyd, one-time governor of Virginia and ex-Secretary of War under President Buchanan. Gideon Pillow, an accomplished veteran of the Mexican War. And Simon Bolivar Buckner, an able product of the President's own environment.

With Johnston, the Secretary certainly had no complaint. But the west, he pointed out, was a pretty big territory and a very important one. There was a limit to what one man—even Johnston—could personally supervise. The present situation forced him to rely too heavily on the judgment of detached subordinates. Buckner he believed to be a willing soldier. Floyd and Pillow he considered in the same category with some other Presidential appointees—Winder—Northrup—and his references to the latter were acid.

The conference degenerated to personalities and, in the end, Benjamin received for his pains a pithy reiteration of the administration's policy on the use of colored resources in the war effort. "Impressments must not be resorted to except when absolutely demanded by the public necessities, and their burden must be apportioned among the community, equally and impartially, having due regard for the means and ability of owners of property."

More than that, Davis enunciated a policy which severely restricted the Office of the Chief of Engineers. As the President saw it, the Engineers constituted an élite corps whose activities should properly be confined to the most elevated branch of military science. In the future, they would not be ordered to perform, nor would they be expected to assume responsibility for, any duty beyond the line of their immediate profession, except, of course, by order of the President of the Confederate States of America.

But on Benjamin the President could not completely close the door to further Engineer organization. He was too useful—and too dangerous. Could not steps



Improvised Blanket Pontons for River Crossings be taken along more harmonious lines, avoiding these controversial aspects of the problem? Could not a plan be presented more in keeping with accepted practices and established policies?

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*Parts I and II of this article were published in THE MILITARY ENGINEER for November-December 1950 and January-February 1951, respectively. The concluding Part IV will appear in the next issue.

It was a nebulous directive, at best, and it put Rives on uncertain ground. He was not a mind reader. Neither was he an authority on military organization. The United States Corps of Engineers, witn which he had become somewhat familiar in his work for the government prior to the war, had possessed a solitary company of Engineer troops. The French Army, of which he had gained a working knowledge while pursuing his professional studies in that country, maintained Engineer troops at the approximate strength of one company per division. Confederate legislation had provided no field organization beyond company level. Of one thing he was certain, Engineers by the company would never meet the South's requirement. They were needed by the division. Too, in the old United States Engineer organization, there had been a division of responsibility between a Corps of Engineers and a Corps of Topographical Engineers which he held to be an extravagant administrative compromise.

This time, however, Rives called in the legal experts and they shortly turned out an innocuous recommendation for four battalions of pontoniers and a small topographical corps. This measure the President hastily approved and forwarded to the Congress. It reached the legislative chambers at a time when another matter of more historic significance was under consideration.

A SIGN IN THE SKY

The inauguration of the Honorable Jefferson Davis as *permanent* President of the Confederate States of America was set for February 22, 1862, there having been held during the Indian summer of the preceding fall a general election to validate the *provisional* organization established by the Congress of Montgomery during February of 1861. And the cloak of legality thus to be cast over the shoulders of numerous of the February Patriots was not altogether shunned. They spoke ardently still for secession—and they put the emphasis on secession. Northern policy makers were capitalizing on rebellion—a thing generally associated with gibbets—and they were giving the word a venomous twist.

At best, rebellion is an uncertain business; the task of conducting one is always risky and difficult. Success depends upon an outstanding leader with a few loyal subordinates capable of inspiring public confidence. Though they might liken their cause to the American Revolution and set aside the birthday of America's greatest rebel for the inauguration of their first president, there was creeping realization in the best informed Southern circles that neither Jefferson Davis nor his friends were cut from the same cloth.

When he had hurried to Richmond in the first hour of crisis, amid a flurry of rumors that he would take the field in person, and with Lee and Beauregard as lieutenants, assume direct control of operations, the press had risen up in mass to cheer. "With him," asserted the Richmond *Examiner*, "the victory would be certain, and chance become certainty." They proclaimed him ". . . a tower of strength, with the iron will, the nerve, the energy and decision of Andrew Jackson, and more than Jackson's knowledge and general education." In the eyes of the Richmond *Dispatch* he was ". . . a statesman in every way qualified for his task; he has foresight, judgment, fertility of resources and wonderful composure of spirit. . . ." Northern papers did not hold back. He was, announced the Cleveland *Plain Dealer*, "A genuine son of Mars." But the Bangor *Democrat* topped the field with the pronouncement that his was ". . . one of the very, very few gigantic minds which adorn the pages of history. . . ."

The President was not one to be flattered by praise but he was not offended thereby. Though, in his own opinion, he was better suited by attainments to command of Southern forces in the field, he had accepted the office of chief executive confident that he was adequate for both. Who, indeed, in the South could offer such a background of achievement: a graduate of the United States Military Academy; hero of the Mexican War; one-time Chairman of the Senate committee on Military Affairs; ex-Secretary of War.

He had come through the initial trials untarnished in the public eye. The elections of the previous November had reaffirmed his personal popularity and prestige. The press, however, was beginning to take notice of traits of character undetected in the first blush of adulation.

Upon the government of the Confederacy he had succeeded in fastening all of the policies he personally had advocated. In none of them would he admit of error although his theory of cotton supremacy was turning out to be a flat failure. There was no sign of intervention from Victoria and the apparent intentions of Louis Napoleon were far from reassuring to either North or South. His cabinet was of his own choosing, and he had been free of restraint in choice. But it was a disappointing congregation, a rich field for carpers. Prices were constantly increasing. The value of Confederate money decreasing. Trading with the enemy approached the proportions of a public scandal. To the urgent need for leadership and action, the President and the cabinet responded with ineptitude and inaction. And to these internal troubles were to be added the endless quarrels with the various governors.

In the face of ominous Union concentrations in the west and along the Potomac, his military policy of defending everywhere at once precluded the assembly of a major striking force. With his own commanders in the field, he was beginning to deal in ". . . a quick, pettish manner. . . ." Between him and Joseph E. Johnston there was open friction and in every command of significance he was demonstrating a capacity for meddlesome interference, down to the minutia of minor staff appointments. Everywhere rancor and discontent began to stir themselves, but as the sniping fire of blame and disparagement took on the inevitable personal cast, the President withdrew deeper into the secrecy of his own self-confidence.

The field, however, in which the seeds of hatred were really being cultivated was that of the President's addiction to crony-ism. During the summer of 1861 there had turned up one fine day at the War Department a grayish old man with the petulant demand that he be made a general. He was John Henry Winder, son of the unfortunate General Winder whose army had evaporated at Bladensburg some half-century before and let the British in to burn Washington. Functionaries thought him a litte daft. What they did not understand was that he had been a professor of tactics at the Military Academy while Jefferson Davis was a cadet and that a most pleasant association had extended on through Davis' tenure of office as Secretary of War. Within a month Winder was made a general and given command of the military police in the capital—a province which, in his eyes, extended from the Potomac to the Rio Grande. He began to invite public attention to himself with his cruel and inhuman treatment of Northern prisoners at Libby and Belle Isle. Now, with espionage being openly conducted, he was according staunch Confederates little better case.

And there was the Pepper Doctor from South Carolina, Lucius B. Northrup. Davis and Northrup had been classmates at West Point. Following graduation, Northrup had pursued for a time an indifferent career in the Army, being virtually cashiered, finally, for excessive absence without leave. When Davis became Secretary of War, he not only reinstated Northrup but promoted him to Captain to put him up with the rest of his class. Davis appointed Northrup Commissary General of the Confederate Army. His warehouses were full but in the field many of the troops were already on half rations and were half naked.

All of these things added up to trouble.

The inauguration weather was deplorable. The most beautiful autumn within memory had degenerated into recollection's bitterest winter. Snow and sleet which thawed and became a driving rain turned Richmond's streets into a sea of mud. The worst was saved for the day itself and as the hour approached, a city which was already overcrowded became more crowded still. The Capitol roof, the steps, the windows and porches of adjacent buildings were black with spectators. The Parade, the Capitol Square, the grounds were packed with people. In the soggy paths and in the streets beyond the great iron gates of the entrance, the crowd stood ankle-deep in the freezing slush, huddled under ranks of dribbling umbrellas, sodden canvas squares, and bits of carpet and oilcloth, to watch the man in whom they had placed their hopes take the oath and kiss the Book in confirmation of it. As he stooped, the thunder rolled and the clouds opened in a blinding downpour. A deep involuntary murmur rose from the crowd.

There was a reception at the Executive Mansion that evening. At first the band played brassily (Confederate field music was more noted for its enthusiasm than for its quality) for its own entertainment, since the crowd came late. But come it did, finally, and though the affair was damp, it was not altogether unsuccessful. The President's manner was grave. To the cheerful Mr. Benjamin and those about him he looked unusually tired. None of them knew of the telegram he had been carrying in his pocket since morning. Fort Donelson had unconditionally surrendered to a Federal force under Ulysses S. Grant.

THE SEASON OF DISCONTENT

"Events," the President admitted frankly that spring of 1862, "have cast on our arms and hopes the gloomiest shadows." Within a few days after the surrender of Fort Donelson, Nashville was abandoned and Fort Columbus evacuated. Albert Sidney Johnston had halted finally at Corinth, in Mississippi. Island Number Ten was fortified and garrisoned, but there was frantic activity at Vicksburg. Price and Van Dorn had been defeated at Pea Ridge. All of Missouri, Kentucky, and Tennessee were gone. Along the Potomac, the greatest army ever collected on the North American continent was stirring. The President proclaimed a day of national prayer and fasting—and telegraphed to Savannah for General Lee to come at once to Richmond.

Busy though he was, President Davis found time for the Corps of Engineers. To the restrictive instructions he had given Secretary Benjamin the previous winter, he now added others. Between the Engineer officers of the Corps and those of field commands he drew a distinct line of cleavage. When *Corps* officers and *Command* officers were both present, the senior was to control the situation in all points of plan and procedure, but no Corps officer was to be allowed to exercise superior rank in respect to troops. Inasmuch as there was no limitation on rank within the field commands—an officer might be appointed colonel of infantry to fill a vacancy, then be designated as staff engineer—but promotions in the Corps were limited to the grade of captain; the Office of the Chief of Engineers was effectively blocked in all directions. And the President was not content until all of his directives were down pat in law and regulations.

Twisting Rails in Track Demolition

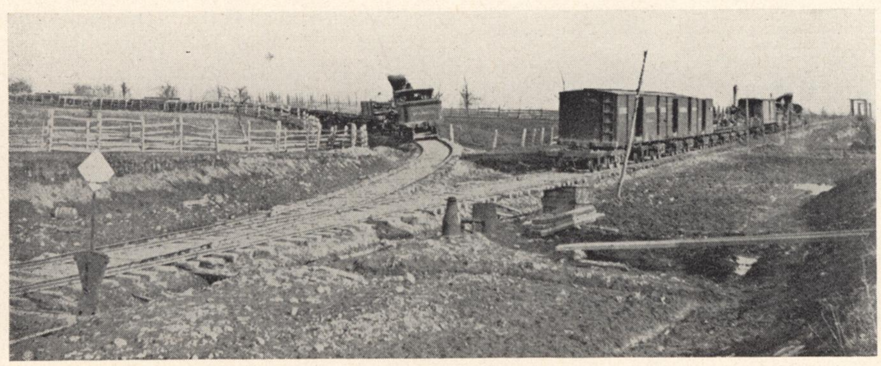
Before Seven Pines, the Corps had been stripped of its mining and smelting operations and its Signal functions had been given over to the Office of the Adjutant and Inspector General. The Engineers remained responsible for the repair of railroads, but the Quartermaster General assumed control of construction. Before Second Manassas, Lt. Col. Jeremy F. Gilmer superseded Rives as Chief of the Corps. Alfred Rives was not a man to back off from the fire and Gilmer knew an engineer when he saw one. The former Chief stayed on as assistant to the new, and the latter was glad enough to have him. Together they set about to find something to do "confined to their immediate profession."

For a time this consisted largely of plans and recommendations, the perfection of administrative routine, and improvements in orders and regulations. In the Presidential visitation the Engineer shops established by Rives about the Confederacy had been over-looked. Here extensive research and experimentation of immense value to the Ordnance Department and the Nitre and Mining Bureau was carried out, as well as production of pioneer equipment for the field forces. There was a constant round of activity to bolster the crippled morale of the departmental agencies of the Corps. All in all, it was a season of discontent.

POLITICS AND LOGISTICS

Colonel Gilmer was determined not to let the Corps die on the vine. Former zeal and energy might have displeased the President but common sense and insistent demands from the field called for further efforts. In the fall of 1862 he busied Rives with new plans for expansion.

By December the Assistant Chief had ready a proposal which would have raised Davis' estimate of his diplomatic adroitness had he fully understood what Rives had concocted. The plan called for the activation of four engineer regiments. Troops and officers were to come from men and units in the field at the ratio of approximately one company per division—a paper strength scarcely to be missed. Army commanders might object to this in reality, conditions being what they were in late '62, but it was not contemplated that they would be consulted. In so far as was possible, officers were to be obtained from the ranks on the basis of skill in some branch of mechanics, and noncommissioned personnel were to be selected on the same basis—a double-barreled shot at both congressman and field soldier. But it was for Davis himself that Rives set the real trap. Every table of organization, every grade and rating, every administrative arrangement of precedence and command, every plan and specification for every piece of equipment, was lifted directly from something to which Jefferson Davis had affixed his approving signature during the time he was Secretary of War.



Typical Railroad Junction

Without waiting for their recommendations to pass through the executive and legislative mill to become law, Gilmer and Rives set about preparing the required trains.

Such foresight, thought the President, when the proposal was finally laid out for him, was commendable. He would urge the Congress to act with all reasonable promptitude. General Orders Number 66, Office of the Adjutant and Inspector General, May 22, 1863, announced the organization to amazed commanders in the field.

Robert Edward Lee was not given to exhibitions of temper or resentment, but from the Government he was trying to serve he had endured a great deal. His patience, during the spring of '63, was a little thin about the fringes. In the Army of Northern Virginia he ordered the directive suspended and such troops as had been collected returned to their commands. He readily admitted the value and necessity for Engineer troops but his army had suffered losses which had shaken it to its foundations. It was fighting for its life and there was no room for any activity not bearing directly on that issue. Moreover, it was an army literally starving to death in the field. If troops, Engineer or otherwise, could be spared for any purpose, they should be put to work at once on the railroads.

Since the outbreak of the war, Richmond had been linked to the South Atlantic states by a sketchy network of railroads of varying gauges which operated into Virginia, with frequent halts and changes of cars, via Savannah, Augusta, Charleston, Florence, and Wilmington, through Petersburg. It was an exposed route and a source of constant worry and trouble to the government. The individual roads which comprised the network were local affairs; their operation and maintenance casual and expensive. Many of the employees were from the North and not incapable of sabotage. Bridges were constantly being destroyed and the junctions were the objectives of constant Federal advances from New Bern towards Goldsboro.

For the past winter Lee had depended solely on the single track of the Richmond, Fredericksburg, and Potomac to bring up vital supplies and ammunition. This road was a wretched affair. Military passengers beheld uneasily its lofty wooden trestles, the deeply eroded embankments, and cuts destitute of revetment. As their clanking trains hurtled along over flimsy rails laid without ballast, and often on no more than roughly leveled ground, they longed for the security of the battlefield.

Lee had long advocated the construction of some 30 miles of road between Danville and Greensboro to open a second and well protected route over which to move supplies from the interior into Virginia. Now he became insistent.

What was true in Virginia and along the seaboard no more than reflected conditions all over the Confederacy. President Davis had been considering a proclamation urging the people of the South to plant food instead of cotton. It might be well, he thought, to have the various presidents of the Southern railroads meet in Richmond to discuss requirements with his military staff.

Totting up their figures, they found that approximately 50,000 tons of rails annually would be required to meet purely military demands. The Atlanta and Tredegar works were capable of producing some 20,000 tons of this, but, as the President's advisors explained to them, the total facilities of both sources were required for military and naval purposes. To close the Danville-Greensboro gap, it was agreed to take up and use the York River road. Apart from this, the Southern railroads, like the Corps of Engineers and most other agencies and individuals who strove to serve their government, were left to make bricks without straw.

The Confederate Corps of Engineers—Part IV*

ROBERT R. ELLIS
Lieutenant Colonel, Corps of Engineers

IN the general reorganization of the Southern armies which followed the military disasters of Gettysburg and Vicksburg, the Confederate Corps of Engineers reached its final development. The departmental framework under the Office of the Chief of Engineers was subjected to little revision and the major changes were administrative. Colonel Gilmer was promoted to Major General of Volunteers and assigned to field command. Lieutenant Colonel Rives for the second time became Acting Chief of Engineers. Provision for engineer troops in the Army commands, however, was considerably expanded. The new structure authorized one engineer regiment for each of the major field armies, one regiment for general service, a foreign regiment for improvement of fortifications, and a mounted battalion for use with the cavalry commands. In addition, the plans for colored labor service troops, proposed originally by Rives during his first assignment as Acting Chief of Engineers but rejected by President Davis, were hauled out and approved. But authorization, in the Confederacy, had never been closely associated with implementation and it was not until the spring of 1864 that these new organizations were operative in the field.

ENGINEER TROOPS

The First Regiment of Engineers, under Col. T. M. R. Talcott, was allocated to the Army of Northern Virginia and began recruitment and training in Richmond. No sooner had it taken on some semblance of strength than it became the subject of controversy. General Winder demanded it for prison guard. Commissary-general Northrop felt that it should be used to protect stores. Both of these gentlemen, friends of the President, were incensed when the commander of the Richmond defenses requisitioned it for road repairs. General Lee, to whose army the regiment was assigned, was not consulted but Talcott appealed to Rives and the Acting Chief stepped in to prevent the interruption of organization and training. By February of 1864 the regiment was ready for the field and shortly afterwards, reinforced by two companies from the Second Regiment of Engineers, began tactical operations.

The Second Regiment of Engineers, nominally under the command of Maj. D. Wintter, was organized for general service and its companies were never brought together in the field. Two served with Lee's Army, four were distributed through North and South Carolina, Georgia, and Mississippi, and four were assigned to Alabama.

Johnston's Army of Tennessee drew the Third Regiment of Engineers under Lt. Col. S. W. Presstmen. The regiment was the first of the newly authorized engineer units to be ready for the field but Brig. Gen. Danville Leadbetter, first of the Confederacy's Chiefs of Engineers and new Chief Engineer of the Army of Tennessee, dissipated its strength in minute detachments. The Army remained virtually without engineer service until the activation and assignment of the First Foreign Regiment (Engineer) composed of Irish and German prisoners of war under Col. J. G. Tucker.

The First Battalion Engineer Troops (Mounted) was scheduled for cavalry support in both Armies but its operations were confined to the Trans-Mississippi department. Tables of Organization provided for ten troops, nine of which were actually in service by the spring of 1864.

DECAY

Few in the South were disposed to look on the dark side of the Confederacy's situation that June. It was true that the loss of Vicksburg and the retreat from Pennsylvania continued to exert a depressing influence on morale and the economic situation had degenerated. Flour was bringing five hundred dollars a barrel. A bushel of potatoes cost a hundred and sixty. Fresh peas were ten dollars a half peck. Field peas, rice, salt pork, and corn bread were the common ration, washed down with a coffee substitute made from dried beans and peanuts and for which there was neither milk nor sugar. Sorghum was the only sweetening, and a popular dish in hotels and restaurants was *Benjamin*—hard tack cooked in scalding water and sprinkled with salt. Nails were worth their weight in silver and other articles once cheap and common were equally valuable. A straight pin picked up on the sidewalk was a rare find; they brought five dollars a paper in shops which still had them. Tableware was so scarce that knives, forks, and spoons could not be had at any price and a dozen ordinary cups and saucers brought two hundred dollars at auction. But throughout the South the news of Cold Harbor brought resurrection of hope, and in the Valley there had been another victory—always a good omen. At New Market a force so small that the boys from the Virginia Military Institute had marched to swell the ranks turned back Franz Sigel.

News from other theaters was satisfactory. In Georgia, Johnston was drawing Sherman farther and farther from Chattanooga and there were loud remembrances of Winfield Scott's admonition: "Beware of Lee's advances and Johnston's retreats." There was one, the Acting Chief of Engineers, not so optimistic. In his mind there lingered still the memory of his punishment for having presumed upon command with the suggestion that loss of Fort Donelson could mean the loss of the Mississippi but that loss of Chattanooga and Atlanta would mean the loss of the war. As Rives saw it, every step south for Johnston weakened his already precarious communications system and strengthened his adversary's. Except for the intercession of the Almighty, Johnston's retreat could end in only one way—a further subdivision of the South. There was another disquieting matter, as yet undisclosed to the public, which had come to Rives' attention. When he had interceded with the War Department and the President on behalf of the First

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*Previous installments of this article have appeared in consecutive issues of THE MILITARY ENGINEER beginning with November-December 1950. This installment concludes the series.

Regiment of Engineers, he was fully aware that complaints and protests against the Commissary-general were pouring in upon the President from all sides and that Davis' stock answer was to the effect that Northrup was one of the great genuises of the Confederacy and that if it were not for his age, he would make him commander-in-chief. What Rives had learned during the transaction was that grafters were not only allowed to monopolize the use of the railroads but that officials of the Commissary Department were speculating with the Army's supplies, the most deeply implicated being personal friends of the President. Once they had provided not two days' rations for the entire Army of Northern Virginia.

Within the Armies of the Confederacy, while there was general dissatisfaction, there was no thought of mutiny or revolution. Scurvy was incipient. Not a day went by without disheartening casualties. Superior Union weapons and ammunition took sickening toll of Confederate military leadership. But the new Engineer regiments had fixed upon them quickly the concept of fidelity already ingrained upon the older units. None of them could boast of good shoe leather and few could shield their backsides from the raw March winds, but their weapons and their trains were bright and sound. With the rest of the Army, and against the enemy, they could hold their own. Those who stayed on now were tough and loyal. The weak had long since perished or gone home.

As Johnston continued to retire, without fighting, there was more public criticism of the President but in the capital it was short lived. There was new cause for concern—and closer to Richmond. Sheridan appeared in the Valley, then Hunter, and the Federal policy for Virginia became as clear as it was for Georgia: "Burn it out!" There was a wave of revulsion in the city when prisoners from Hunter's command turned out to be Germans fresh from the old country who spoke no English and whose ambition was pillage. Accounts filtering in from behind his lines were bad: fields bare and burned, fences gone into campfires, smoke from burning homes never out of the sky, vehicles destroyed and animals driven off or slaughtered on the spot, slaves debauched by whiskey and abolition agents.

PETERSBURG

There came a hectic day when the Federal Army opposing Lee shifted to the James River and only Beauregard's heroic defense of Petersburg saved Richmond from capture and destruction. In the crisis the First Engineers hurried through the city with a captured Federal ponton train and bridged the river in time for Lee to cross and put an end to the danger. Those who thought they grasped the significance of the event breathed freely once more, but there were many strong men who wept bitter tears. Lee's Army of Northern Virginia, whose engineers, organized and improvised, had swung the supple columns across the rivers and guided them across the plains and mountains to strike deep into the enemy's country, was at last pinned to the ground and the fighting boiled down to a war of attrition.

The city of Petersburg was quickly knocked into ruins. Death made no distinction and the bodies of women and children lay in the streets along with those of the fighting men. Stark hunger walked the town and a half starved little girl sang for her supper among the engineers working frantically to learn overnight the art of siege warfare—parallels, approaches, rifle pits a hundred yards apart, trenches at two hundred. It was a new experience, this grubbling in the earth like moles, but they took it well. Living in rat holes dug into the sides of trenches, their clothes in rags, their blankets in tatters, their filth became insufferable and they begged for soap or for food. Northrup, apprised of the situation, reviewed his inventories and advised that the Army had plenty of soap, eight hundred barrels in storage at Charlotte.

Their short ration grew shorter with the days. At best it consisted of one pint of cornmeal and four ounces of "Nassau Bacon" a day, and of this meat ration they jested that the Yankees had let it through the blockade to poison them. Once things did improve for a few days and eight Confederate engineers got as much to eat as one Federal. Then for a week they had no rations at all. Actually there were four railroads to feed the town and its defenders, but between the muddleheadedness and incompetence of Northrup's agents and the incessant pounding of Grant's troops, they were virtually cut off and abandoned. The railroad station and Pocahontas bridge over the Appomattox were exposed to enemy fire. Elsewhere Grant's cavalry tore great gaps in the lines which could not be repaired and teams had to be used to haul supplies across the breaks.

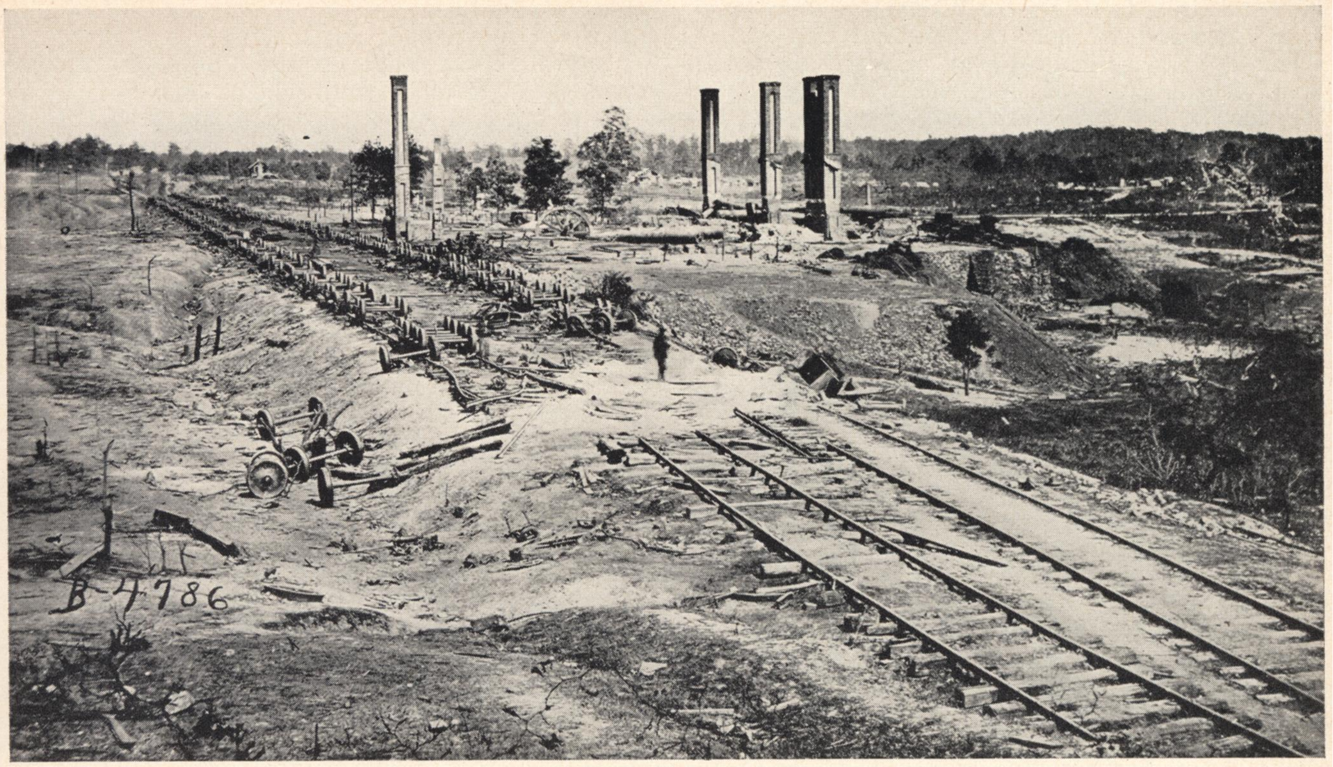
The moment the preliminary fortifications were completed, the engineers began a new operation in excavations. Munitions and the materials for making them grew so scarce that the infantryman's day of fire was limited to eighteen rounds. Artillery fired only against visible targets. Amid the heat, the filth, the flies, the stench of open latrines, and the racking odor from shallow graves, they dug for shell fragments to make scrap iron, screening the earth with their hands for bullets to be remoulded and fired back at the enemy.

In August, Farragut put the stopper in the port of Mobile and early one September morning the deep throated huzzas of the Blue Army swelled up from the works at Petersburg. The Confederates thought it hailed the nomination of McClellan for President by the Democratic Convention then meeting in Chicago. A full week went by before they knew the true cause. Sherman had anchored his flank in Atlanta.

ATLANTA AND WILMINGTON

Understanding of the magnitude of the disaster throughout the South was general and thorough and news of it was received with mixed grief and anger. Public denunciation of the President became as loud as it was bitter. Davis, however, maintained that Sherman at Atlanta was like Napoleon at Moscow and sought to animate the discouraged with optimistic promises based on the hypothetical return to the ranks of the Army of half of those now absent. He enunciated his theory of Sherman's coming retreat to one Confederate congressman who hotly retorted: "He will, no doubt, right into Richmond!"

In the Office of the Chief of Engineers, Colonel Rives reviewed the engineer losses in the Atlanta Campaign—roughly 70 per cent—and shut his teeth in silence. The troops were gone and there were no others to take their places. Atlanta was gone, too, with its machine shops and its foundries. And to Rives it represented more than physical resources: it



Brady

Destruction of Hood's Ordnance Train and Georgia's Central Railroad and Surroundings East of Atlanta, 1864

was the back door to Richmond. While Grant hammered away at the front, Sherman was now in position to open it. But Sherman was not yet finished in Georgia. Instead of turning north, he headed his columns toward Savannah and the sea.

As autumn wore into winter there was talk that Davis had lost faith in Lee because after the fall of Atlanta Lee had told him that the lines about Petersburg were too extensive to be held by the troops at his disposal; that the one hope of keeping the war going was to evacuate Richmond and unite all of the armies farther south. Davis was reported to have demanded that Richmond be defended at the expense of all else. Others suspected that Davis' tiff was the result of loose talk in the Confederate congress of making Lee dictator. There were other rumors that the President had taken to interfering with Lee's dispositions as he was still doing with the movements of commanders in the west. The Army, for the first time, showed genuine signs of unrest when Davis brought in Gen. Braxton Bragg as his personal military advisor. Bragg was another of the Davis cronies, with a combat record of having never lost a minor argument to a subordinate or won a major battle from the enemy. The Army could not stomach Lee's having to address this man as "commander-in-chief."

Before Christmas, a major Federal effort to reduce Fort Fisher protecting Wilmington, the one remaining major port open to the Confederacy, developed and the Office of the Chief of Engineers began supervision of relief operations. General Whiting was in active command of the defenses and his works were Confederate engineering at their best. The movement of reinforcements from the Richmond area was so slow, however, that sabotage was suspected. The simple truth, Rives reported officially, was that the Piedmont line, over which they moved, had been worn down by raids, use, and neglect until it was in complete ruin. In the cars, not a door or a window remained, much less a stove. The engines and the roadbed were in such condition that the march tables were a mockery.

There was little enough for cheer throughout the holiday season. Turkeys were a hundred dollars apiece and the best gift to be had was a bit of captured enemy sugar ration. But when the clerks in the engineer office reported for duty on the second day of the new year, Rives had a real surprise for them. Coffee! Real coffee! And it was to be the last of any pleasant associations with the Corps. When Fort Fisher fell on the sixteenth, not even those closest to the true military situation were prepared for the aftermath.

A few days afterwards four blockade runners slipped into Charleston. In an effort to get their vital cargoes to the Richmond area, the government suspended rail passenger travel. The Central Railroad retaliated by refusing to move either supplies or troops and the Piedmont dumped great piles of salt and forage along the right-of-way to rot in the rain and mud. This reaction was new and ominous but nothing to compare with the looting by the troops when unexplained fire swept warehouses in Charlotte. Word came from Savannah that people of prominence there had coaxed Governor Brown to call a state convention and from North Carolina shortly there was news that Confederate money was no longer acceptable exchange.

In the new crisis Lee left his desperate post at Petersburg long enough to come to Richmond and ease the President's mind in another petty matter fabricated by the state of Davis' nerves. He found the capital noticeably less crowded. All through the winter people had been refugeeing to Charlotte, Milledgeville, LaGrange—anywhere they thought reasonably safe from the Yankees. Arsenal and ordnance machinery had been dismantled, packed, and shipped to Danville and Greensboro. In the War Office, the archives were boxed and stacked. Lee appeared there, wearing a blue cloak over his neat gray uniform. He walked briskly, looked vigorous, but old friends seeing his face for the first time since Gettysburg, turned away in disbelief.

In his Army there remained not the slightest illusion of hope. The persistence of the President in hanging on to his cronies regardless of their complicity in acts outrageous to the public conscience, the continued honoring of rascals with high places and pardoning of known deserters, the authorizations for military details for private purposes too often connected with speculation, the ideals of the Conscription Bureau which handled 150,000 cases in twelve months and sent less than 10 per cent of them to the firing line—none of these things escaped the understanding of the men in the ranks. The coming of winter had only changed the torments of heat and dirt and filth to those of freezing mud, sleet, and snow. Hunger dogged them throughout.

The First Regiment of Engineers was a tough residue after months of winnowing by drouth, rain, snow, hunger, skirmish, battle, and disease. They had set out to be the crack regiment of the Army and stood now in Lee's affection second only to the Texas Brigade. The military situation to them was crystal clear. Grant's Army confronted them. Thomas was coming on from the west. Sherman had swung north and Johnston's affair at Bentonville deluded no one. Their only thought now was: "Who will see the end?"

RICHMOND

It was a day typical of Richmond's Sundays. Bright, beautiful, with a hazy mist drifting under a brilliant sky. In Saint Paul's, the President, stiff and solitary in his pew, was handed a note which turned his face an ashen gray. When he strode quickly from the church, others made to follow him, but the rector interrupted the reading demanding that they stay. They did not have to have confirmation. Every heart knew the contents of the message—Richmond was to be abandoned.

In the early afternoon, banks opened for business and depositors drew out what they could get in hard cash while treasury clerks set millions in paper money blazing in Capitol Square. War Department employees were summoned on the double and hurried last minute packing began in the various offices. Drivers appeared with their wagons and carted off the archives to the Danville station. An engineer detachment began preparations for demolitions and at the sight of this activity panic broke over the city.

Excited crowds laid siege to the stations, wagons, and porters, heaping the platforms with trunks and boxes. Exodus began, people evacuating the city with whatever transportation they could lay their hands on. Women hastily stitched up bags and "pockets," filled them with pitiful remnants of family treasure and set off across the open fields on foot, whimpering children in tow. Packet boats in the canals filled to overflowing and set up guards to beat off would-be passengers.

The Commissary stores and the contents of the Government Bakery were thrown open to the public. Crowds milled about the doors, trickling away like ants from the fringes—old men, women, children, laden with hams, boxes of crackers, sacks of meal and flour; strong men trundling wheelbarrows, rolling barrels of sugar, pork, and molasses.

General Breckenridge, currently Secretary of War, remained at his office until sun down keeping it an oasis of order in a desert of confusion, then buckled on his sword and set out to join the Army. At the White House affairs did not go smoothly. The President's servants turned against him and Mrs. Davis' personal effects simply disappeared. It was the faithful Benjamin who came to the rescue and got the Presidential party safely aboard a special train.

The streets were filled with rioting mobs. Government commissioners for hours had been destroying the liquor supplies, staving the kegs of whiskey and spirits, dumping the contents into the gutters. They ran ankle deep and the city's dregs—deserting soldiers, blacks and whites—danced and capered in them, drinking from their cupped hands, dippers, basins or whatever could be found. Orderly issuance of stores at the Commissaries became rank plunder. At one of the stations, the treasure train, loaded with the Government's gold and the specie reserve of the banks, barely escaped looting.

Ruins of the Northeastern Depot, Charleston, Demolished at the Time of Confederate Evacuation

Night had long since fallen but not darkness. The horizon was aglow with the light of the burning dumps and to the engineers, considering how short the Army had been of everything, it was astonishing how much there was to be destroyed. The tobacco warehouses had been set on fire by accident, and with a rising south wind, the flames spread across the city. The great mill district began to burn and then the stores and hotels of the downtown area. Convicts broke out of the penitentiary, applied the torch, and joined the drunken mob, plundering right and left, fire following where they wandered. At midnight the explosions of the magazines shook the city like an earthquake and the thundering detonations of the ironclads of the James River Squadron showered the capital with flaming debris.

Around three in the morning the evacuation of Confederate authority was complete. The mayor and a committee set out in two dilapidated hacks—creaking along through throngs of milling pillagers bearing the spoil of sacked homes and stores; some staggering under bags of coffee and sugar and rolls of cloth; some carrying chairs, paintings, and other household goods; one old drone rolling a great sofa along on its castors —it was urgent that they find a Union commander and get him to restore order in the city.

A NEW MISSION

Within twenty-four hours after the last Confederate engineer of the rear guard had departed from Richmond, Abraham Lincoln sat in Jefferson Davis' White House. News of the final surrender, however, overtook the Southern President at Washington—this one a little town in eastern Georgia. Here the Confederate Cabinet held its last session. Mr. Davis clung to his fixed and illusionary hope of further military effort in the southwest but there was no support for it. He was forced to yield, at long last, his dream of a Confederate States of America. They dispersed then each man to go to his own home—to prison—or to exile—whatever fate might have in store.

The armies, too, were disbanding but by no means all of the troops were willing to return to homes where war had changed everything and many, threatened with proscription, simply did not dare. There were elaborate plans for organization of volunteer columns to go to the aid of the French in Mexico; for colonial expeditions to Argentina and Brazil. Remarkably few of the Confederate engineers joined in these enterprises. They were listening to another voice: "Stay at home. Rebuild. The South needs her sons."

There was literal truth, as well as wisdom, in these words; the South was in ruins. It had come early to the combat areas in Virginia and Tennessee, spreading steadily of its own accord until 1864 when deliberate destruction became Federal policy. Sherman had marched across Mississippi, then back again, then across Georgia and through the Carolinas. Banks laid waste with equal ruthlessness to the Red River country and Louisiana. Sheridan made the Valley of Virginia a desert. Lesser raiders worked through southwestern Virginia and western North Carolina while Wilson marked for destruction in Georgia and Alabama that which Sherman had passed.

Ruins of Richmond, Virginia, 1865 Brady

Richmond was a charred skeleton. Columbia, a mound of crumbling walls set in the midst of a burned out wilderness across which travellers and supplies were hauled from the ends of broken railroads pointing toward the South Carolina capital from all directions. Of the railroad from Columbia to Charleston, nothing was left but the grade. Chattanooga, Atlanta, Mobile, the variation was only in degrees, not in kind. And Charleston, once the proud and defiant center of secession, was a shell-scarred hulk.

Richmond: Preparing to Rebuild, 1865 Brady

Nor was the desolation limited to the cities and major industries. Grist mills to grind the meal and flour to feed a starving population were gone, their dams broken, their machinery wrecked. The cotton industry had received particular attention, the gins razed and thousands of square miles of rich Mississippi delta consigned to swamp, their protecting levees pulled down by the invading Bluecoats. From Washington south across the Potomac, across the Rappahannock to Richmond, the once rich farms and plantations were deserted. The elaborate systems of flood gates, dams, and canals which kept in production the great rice fields of the Carolinas no longer existed.

From Raleigh, General Grant wrote to his wife: "The suffering . . . in the South . . . next year . . . will be beyond conception. People who talk of further retaliation and punishment . . . do not conceive of the suffering already endured. . . ."

"Rebuild."

It was to Lee's spirit that Confederate engineer leadership yielded, and all over the South the ranks took up the task, in beginnings far from pretentious; scrounging the battlefields for scrap to make framing iron and nails, chipping the mortar from the bricks of the burned out walls, preparing them for rebuilding. The engineers had begun a new task.

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The Confederate Engineers

WILLIAM M. ROBINSON, JR.
Major, Corps of Engineers Reserve

THE Congress of Montgomery convened on February 4, 1861. On February 8, it promulgated the Provisional Constitution of the Confederate States of America; and immediately resolved itself into the legislative body of the new federal republic. As soon as it could elect and inaugurate a president, it turned its attention towards the setting up of executive and military establishments. On February 21, three days after taking office, the President approved an act creating the War Department; and at the same time submitted the name of Leroy P. Walker to be Secretary of War. Congress promptly and unanimously confirmed the nomination. The infant War Department went immediately to work. In four days a bill to organize a general staff was presented to the Congress, which passed the bill without discussion. By the end of the week a Provisional Army was authorized.

The engineers were not mentioned in the General Staff Act. However, when the clerical force of the War Department was apportioned (by act of March 7, 1861) to the several subordinate offices, the office of Chief of Engineers was included along with the authorized divisions of the General Staff. The Bureau of Engineers was expressly recognized in a later act (August 29, 1861), which permitted it to employ additional clerks and draftsmen. The act for raising provisional forces did not exclude the engineers, but it failed to assure them of place. The law left the matter entirely in the hands of the President, who was authorized, "to receive into the service of the government such forces now in the service of said states as may be tendered or who may volunteer, by consent of their state, in such numbers as he may require, for any time not less than twelve months, unless sooner discharged." Subsequent acts considerably increased the scope of the Provisional Army, which came to occupy in the Confederate military establishment a place corresponding to that of the "National Army in the service of the United States," during the World War.

Volunteer Forces

The first two acts relating to the raising of volunteer forces positively neglected the engineers, restricting the calls to the cavalry, mounted riflemen, artillery, and infantry. The initial act (March 6, 1861), authorized the President to ask for one hundred thousand volunteers to serve for twelve months, the officers to be commissioned by their respective states. The second act, (May 8), increased the period of enlistment to the duration of the war and enlarged the powers of the President. It directed him—rather than the governors—to commission the volunteer officers and relieved him from the necessity of submitting to Congress a list of his appointees for confirmation, as he was required to do in the case of officers of the Provisional Army. A third act (May 11), practically gave the President *carte blanche* in matters pertaining to the volunteers, and removed all restrictions as to arms of service. Thus the raising of engineer troops was permissible under the third act. However, the "Statement of the regiments, battalions, and companies mustered into the service of the Confederate States," prepared on September 30, 1861, by the Adjutant and Inspector General's Department, included no engineer units; though an appended note stated that there were additional units whose returns had not yet been received at the War Department. It is certain that no engineer troops were raised under the Provisional Army Act, for the Journal of Congress reveals no nomination of officers for such service. A roster of the commissions issued under the act of May 11 would provide a corresponding check on the missing volunteer units; but, unfortunately, such a list is not available. While no volunteer engineer companies show on the extant returns, prior to the first part of 1862, there is strong possibility that a few were early accepted into the service. Incidentally, the departmental statement of September, 1861, returned two hundred and fifty-four regiments.

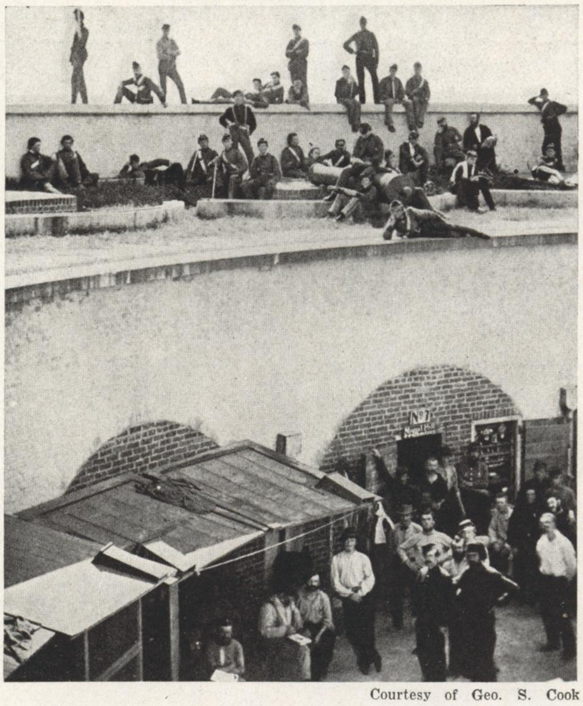
Establishment of the Corps of Engineers

On the same day that the call for one hundred thousand volunteers was authorized (March 6, 1861), the President signed the act for the establishment and organization of the Army of the Confederate States of America. This law, definitely recognized an engineer component. "The Corps of Engineers," it said, "shall consist of one colonel, four majors, and five captains, and one company of sappers, miners, and pontoniers, which shall consist of ten sergeants or master workmen, ten corporals or overseers, two musicians, and thirty-nine privates of the first class, or artificers, and thirty-nine privates of the second class, or laborers, making in all one hundred. The said company shall be officered by one captain of the Corps of Engineers, and as many lieutenants, to be selected by the president from the line of the Army, as he may deem necessary for the service, and shall be instructed in and perform all the duties of sappers, miners, and pontoniers, and shall, moreover, under the orders of the chief engineer, be liable to serve by detachments in overseeing and aiding laborers upon fortifications or other works under the engineer department, and in supervising finished fortifications, as fort-keepers, preventing injury and making repairs. It shall be the duty of the colonel of the engineer corps, subject to the approval of the Secretary of War", concluded those sections of the act relating to the engineers, "to prescribe the number, quantity, form, dimensions, etc., of the necessary vehicles, arms, pontons, tools, implements, and other supplies for the service of the said company as a body of sappers, miners, and pontoniers".

The proportion of engineers to the other arms was very low in comparison with present day tables of organization. But it must be remembered that the great expansion in the engineer service was a feature of the World War. The French division in 1914, included but one company of engineers; and the Standing Army of the United States at the commencement of the War of Secession, with a recruited strength of something over sixteen thousand officers and men, possessed only a solitary company of engineers.

The Regular Army of the Confederate States was to comprise six regiments of infantry, one regiment of cavalry, and forty companies of artillery. The regiments were composed of ten companies, and forty-three officers. The strength of the infantry companies was placed at one hundred men, the cavalry at seventy-two, and the artillery at eighty. Four of the batteries were to be equipped as field artillery and the remaining were to serve as siege or coast artillery. There were to be four brigadier generals. The combat personnel totaled four hundred and seventy-seven officers and nine thousand, nine hundred and twenty enlisted men. Thus the engineers amounted to only two per cent of the officers and one per cent of the soldiers.

Based upon the experience of the United States, this would have been a sufficient peace-time organization. But in view of the impending emergency Congress proceeded in May, 1861, to increase the military establishment, adding two regiments of infantry, one of cavalry and one of zouaves. At the same time the Corps of Engineers was allowed its initial lieutenant-colonel, and five more captains, and "one company of sappers and bombardiers." Similar enlisted personnel was authorized for this company as for the first engineer company; but the officers (one captain, two first lieutenants, and one second lieutenant) were to be especially appointed. This brought the authorized strength of the Corps of Engineers to twenty officers and two hundred men, increasing somewhat the engineer ratio. This increase in ratio was only temporary; for, in 1862, the size of the infantry company was increased 25 per cent and the cavalry troop 10 per cent and artillery batteries were almost doubled, being brought up from eighty to one hundred and fifty men. Also, a great number of additions were made to the commissioned personnel, both in the line and in the General Staff.



Courtesy of Geo. S. Cook

Confederate Volunteers

Regular Army Organization

General Upton in his *Military Policy of the United States* stated that none of the Confederate Regular Army units were organized, and cited this failure as, "another proof that no regular army can ever be successfully recruited in competition with a force of volunteers." However, there is no doubt that the organization of the Regular Army was promptly initiated. Within ten days after the capture of Fort Sumter, the cadres of the First and Second Regiments of Infantry had been completed. About one third of the commissioned personnel of the artillery companies had been appointed; though very little had been done towards the raising of the cavalry regiment. Recruiting details were announced in General Order No. 6, April 22, 1861, and depots were established at Charleston, Augusta, Mobile, and Baton Rouge. But on June 23, the Secretary of War reported that the recruitment of the Regular Army had been suspended pending the organization of the volunteer forces, which had absorbed the facilities of the War Department. He added that the bulk of the volunteers, being for the duration of the war, really stood on the same basis as regulars, and that the effectiveness of the service was not diminished by the suspension. In the meantime, the Congress had appropriated monies severally for the support of the Regular, the Provisional, and the Volunteer forces; and the Secretary of War found himself in a quandary as to accounting. He asked the Attorney General (Judah P. Benjamin) for a ruling but the latter neatly passed the buck. Later, the President in a message to Congress recited the difficulties that had arisen, and said that he had cut the knot by ordering the pooling of the appropriations. He admitted some doubt as to the strict legality of this procedure; but he held that it was justified by the emergency, and by the further fact that the public economy suffered no substantial loss thereby. If the War Department was unable to preserve a strict separation in the three major components of the Confederate establishment, it would seem rather fruitless to try to make a distinction now. Nevertheless, one finds that the compilers of certain of the indexes to the one hundred and twenty-eight books in the several series of the *Official Records of the Union and Confederate Armies* (Government Printing Office, 1880-1902) have indicated some units as regular troops. This is not conclusive evidence that these units were part of the permanent establishment, for the indexing is not uniform; moreover, there are more cavalry units shown as regulars than were authorized, though it happens that the number of infantry regiments is the same. It seems probable that the War Department resumed the organization of the Regular Army; for, in August, 1861, the cadre of the First Cavalry was sent to Congress for confirmation. There is little doubt about the organization of the two engineer companies, as we shall see presently.

Personnel of the Corps of Engineers

The Corps of Engineers was composed almost wholly of officers who had resigned from the United States Army. The percentage of officers who vacated commissions to cast their fortunes with their states was perhaps less in the engineers than in the line of the Army. Ten left the Corps of Engineers and seven the Corps of Topographical Engineers, all but one of whom were received into the regular establishment of the Confederacy at advances of one to two grades. Four of the younger lieutenants were appointed in the Corps of Artillery; but two of them were later advanced in the Corps of Engineers. Major Beauregard, who had been district engineer at New Orleans, was appointed to general grade at once, receiving the first military commission issued by the Confederate Government. He was confirmed as a brigadier-general in the Provisional Army on March 1, 1861. It was fifteen days later before the President submitted to Congress a general list of nominees for appointment in the Army and the Navy. This list included one hundred and forty-five army officers, of whom seven were engineers. Among the latter were Major Danville Leadbetter, of Alabama, who was appointed from civil life, and Captain William Robertson Boggs, of Georgia, who had resigned a first lieutenancy of ordnance on February 1, 1861. During the next few months the other resigners were received into the Confederate service. During the remainder of the war only one more officer (J. V. Gallimard) was added to the Corps of Engineers, making fourteen in all.

The following is a list of the engineer officers who left the United States Army in consequence of Secession, with a statement of their entry into the Conferedate service (Corps of Engineers, unless otherwise specified):

Corps of Engineers

Captain (Brevet Major) Peter G. T. Beauregard, Louisiana, resigned February 20, 1861, appointed brigadier-general March 1, 1861, general in the Regular Army, July 21, 1861.

Captain Jeremy F. Gilmer, North Carolina, resigned June 29, 1861, nominated to be lieutenant-colonel November 27, 1861, confirmed December 13, 1861, to rank from March 16, 1861.

Captain William H. C. Whiting, Mississippi, resigned February 20, 1861, appointed major March 16, 1861.

Courtesy of Geo. S. Cook

General Pierre Gustave Toutant Beauregard, C. S. A.

First Lieutenant George Washington Custis Lee, Virginia, resigned May 2, 1861, confirmed as captain August 28, 1861.

First Lieutenant Walter Husted Stevens, Texas, dismissed May 2, 1861, "having failed to render his accounts" (G. O. No. 50); appointed captain March 16, 1861.

Second Lieutenant Edward Porter Alexander, Georgia, resigned May 1, 1861, appointed captain March 16, 1861.

Second Lieutenant Richard K. Meade, Jr., Virginia, resigned May 1, 1861; nominated first lieutenant of artillery January 24, 1862, to rank from March 16, 1861.

Brevet Second Lieutenant Robert F. Beckham, Virginia, resigned May 3, 1861, appointed first lieutenant of artillery March 16, 1861.

Brevet Second Lieutenant Samuel H. Lockett, Alabama, resigned February 1, 1861, appointed captain March 16, 1861.

Brevet Second Lieutenant Clarence Derrick, Virginia, 1861 graduate U. S. M. A., dismissed July 16, 1861, for having tendered his resignation "in the face of the enemy" (G. O. No. 45); confirmed as second lieutenant August 28, 1861.

Corps of Topographical Engineers

Captain Martin L. Smith, Florida, resigned April 1, 1861; confirmed major August 28, 1861, to rank from March 16, 1861.

First Lieutenant Joseph C. Ives, Connecticut, appointed captain in 17th U. S. Infantry May 14, 1861 (G. O., No. 33, June 18, 1861), dismissed December 26, 1861 (G. O., No. 110), "having tendered resignation under circumstances showing him to be disloyal to the Government"; nominated captain November 27, 1861, confirmed December 13, 1861, to rank from March 16, 1861.

Brevet Second Lieutenant Charles R. Collins, South Carolina, resigned June 10, 1861; appointed first lieutenant of artillery August 28, 1861, nominated captain, C. E., November 27, 1861, confirmed December 13, 1861, to rank from March 16, 1861.

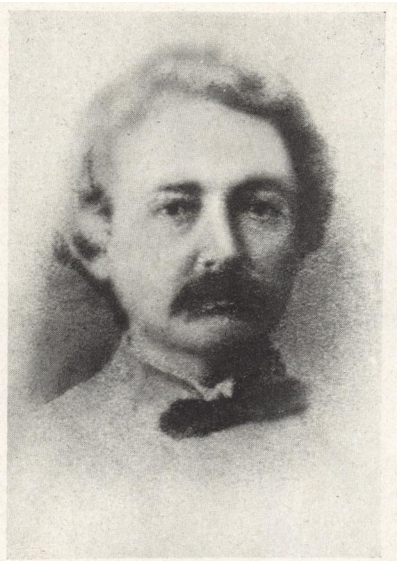
Brevet Second Lieutenant William H. Echols, Alabama, resigned March 21, 1861, appointed captain March 16, 1861.

Brevet Second Lieutenant William Procter Smith, Virginia, resigned April 27, 1861; appointed first lieutenant of artillery on January 28, 1862, to rank from March 16, 1861, promoted captain C. E., October 9, 1862.

Second Lieutenant Joseph Dixon, Tennessee, resigned June 28, 1861, appointed first lieutenant of artillery on January 28, 1862, to rank from March 16, 1861.

Captain Francis T. Bryan, resigned June 10, 1861, and took no part in the war.

The foregoing dates of resignation are the dates of acceptance by the Secretary of War as shown in the 1861 series of General Orders, Adjutant General's Office, Washington, D. C. The orders do not show the dates on which the resignations were tendered. The facts relative to appointments were taken from the Journal of the Confederate Congress; but no records are available from which to ascertain the dates of acceptance of the appointments. It is reasonably certain, however, that most of the officers refrained from entering upon a Confederate commission until their resignations were accepted; but the dismissals recorded in the above list indicate that irregularity was imputed to a few officers. The Confederate law provided that all officers who tendered their resignations from the Army of the United States prior to September 6, 1861, should be recommissioned in the Confederate States Army as of the same date, in order not to disturb the relative rank, "held anterior to the secession of these Confederate States from the United States." This accounts for the antedating of so many appointments to March 16, 1861. Incidentally, the failure of President Davis to follow this rule when filling the five vacancies in the grade of general in the permanent establishment produced considerable feeling; and led to unpleasantness between the President and General Joseph E. Johnson.



Courtesy of Geo. S. Cook

Major General W. H. C. Whiting

All of the members of the Corps of Engineers, C. S. A., rose to field or general grade in the Provisional Army or the Volunteers except the one who was appointed late in the war. Four became major-generals (Smith, Whiting, Lee, and Gilmer) and four brigadier-generals (Leadbetter, Boggs, Alexander, and Stevens). Whiting was promptly jumped from major to brigadier-general and in April, 1863, was promoted to major-general. He served as a brigade commander in Virginia until he was sent to Wilmington in the fall of 1862, to command the District of Cape Fear—where he had been district engineer before the war. The marvelous defenses of the Cape Fear attest his skill as an engineer and soldier. At the close of the war he gave his life in the final defense of Fort Fisher, dying from his wounds as a prisoner on Governor's Island, New York, in March, 1865. Major Smith became the colonel of the 21st Louisiana Infantry and then stepped up the two lower grades of generalcy. He was a district commander in the Mississippi Valley during the first part of the war and commanded a division at Vicksburg. Later he served successively as chief engineer of the Armies of Northern Virginia, of Tennessee, and of the Trans-Mississippi. George Washington Custis Lee went up from captain to colonel of cavalry on the President's personal staff in August, 1861; and thence to brigadier general of volunteers, commanding the local defenses of Richmond. In October, 1864, the President made him a temporary division commander in the Army of Northern Virginia. Just before the end of the war the Senate confirmed him in the rank of major general. Gilmer went from lieutenant colonel to major general of volunteers. He was department engineer in Virginia and in the West during the early part of the war, and was wounded at the Battle of Shiloh. In 1863, he was for a time second in command of the Department of South Carolina, Georgia, and Florida. His service as Chief of Engineers will be noticed later.

Captain Stevens, who had been associated with Beauregard when the latter was in charge of public work at New Orleans before the war, became a member of Beauregard's staff in the early Virginia campaigns. He rose to the grade of brigadier general in the summer of 1864, and commanded for a while the local defenses of Richmond. During the siege of Petersburg he was chief engineer of the Army of Northern Virginia. Captain Alexander also began the war on Beauregard's staff, serving first as joint chief engineer and chief of signal service and later as chief of ordnance. He rose to colonel of artillery by the end of 1862; and was made a brigadier-general early in 1864, becoming chief of artillery in Lieutenant General Longstreet's corps. He left a volume of *Military Memoirs*, published in New York in 1908. Major Leadbetter was made a brigadier general in February, 1862; and served severally as a brigade and a division commander and as chief engineer of an army.

Captain Boggs had a somewhat checkered career. In the winter of 1861, he was successively captain of ordnance in the South Carolina Army, ordnance officer on the staff of Governor Brown of Georgia, and acting Chief of Ordnance at Montgomery while the Confederate War Department was trying to get under way. On April 9, he went to Pensacola as General Braggs' chief engineer; but in December he had some unpleasantness with his general and resigned his commission. He accepted the superintendency of the Louisiana State Seminary, the post which Sherman vacated at the beginning of the war. However, he did not enter upon his duties there; but took a leave of absence and returned to Governor Brown's staff as a colonel of engineers. In July 1862, he was appointed a Provisional colonel of artillery and sent to Major General E. Kirby Smith for duty on his staff. In October he was restored to his former position on the Corps of Engineers' list; and in November (1862) he was appointed a Provisional brigadier general, becoming chief of staff to Smith, who in the meantime had been promoted to be a lieutenant general. In this position he remained until the end of the war except for a very brief tour of duty as a district commander in the Trans-Mississippi Department. His *Military Reminiscences*—somewhat accusative in matters of Confederate military policy—were published as volume iii of the John Lawson Monographs of the Trinity College

Historical Society in 1913, at Durham, North Carolina.

Captain Collins, after serving for a time as district engineer at Wilmington, became major of cavalry commanding the 15th Virginia. He was promoted to be colonel and recommended to be a brigadier general; but was killed in action on May 7, 1864.

Captain Ives, in April, 1862, was appointed to the President's staff with the rank of colonel of cavalry. Captain Lockett rose to a lieutenant colonelcy, in the Provisional Corps of Engineers, and served as chief engineer at Vicksburg and Mobile. Captain Echols was stepped up one grade and became chief engineer of the District of South Carolina. Captain Smith (W. P.) rose to a temporary colonelcy of Engineers, and in December, 1864, was chief engineer of the Army of the Valley. Captain Gallimard, the officer who was added to the corps during the progress of the war, will be mentioned later on as commander of the company of sappers and bombardiers.

In addition to those officers who resigned United States engineer commissions to enter the Confederate Army, there were some very distinguished resigners, who at one time or other in their military career had served in the Corps of Engineers or the Corps of Topographical Engineers. Robert E. Lee, Lieutenant Colonel of the 2nd Cavalry, and Brevet Colonel of Engineers, and Joseph E. Johnston, Quartermaster General of the Army, resigned to become full generals in the Regular Army of the Confederate States. Both of these officers had received three brevets as engineer officers in the Mexican War. Gustavus Woodson Smith, a lieutenant of engineers who had been brevetted twice in Mexico, and subsequently a soldier of fortune in Latin America, entered the Provisional Army with the rank of a major general. George Washington Rains, one time lieutenant of engineers and assistant professor of chemistry, mineralogy, and geology at the Military Academy, brevetted major in Mexico, and, who, from 1856 to 1861, was president and part proprietor of the Washington Iron Works and the Highland Iron Works at Newburg, New York, became a colonel of ordnance and builder of the famous munition plants at Augusta, Georgia.

Courtesy of Geo. S. Cook

Colonel T. M. R. Talcott

Corps of Engineers of the Provisional Army

The Secretary of War, in his report of December, 1861, complained of the paucity of engineer officers and said that five-fold the number was required. He had been obliged to resort to various expedients in order to supply the deficiency. In some cases he had appointed civil engineers as second lieutenants in the line of the Army, and then had conferred upon them temporary commissions of such higher grade as was commensurate with the duties required of them—which the President was authorized to do by the act of May 21, 1861, in the case of Regular Army officers serving with volunteer troops. In other cases he was obliged to use the civilian assistant engineers in the field on purely military duty. He recommended that Congress authorize the appointment of at least fifty junior engineer officers to serve during the continuance of the war.

Congress without loss of time acted on the suggestion of the Secretary, and authorized a provisional corps of engineers to be composed of the recommended minimum number of officers. Under this authority there were promptly commissioned twenty captains, twenty first lieutenants, and ten second lieutenants. This number was quickly found to be insufficient and Congress allowed an additional fifty engineers. During the summer of 1862, eleven captains, fourteen first lieutenants, and six second lieutenants were appointed. It was a long, long front from Virginia to Texas; and the reconnaissances and topographical surveys to be made, the pioneer operations to be directed, and the innumerable defensive works to be laid out and constructed, not to speak of the river and harbor work and railroads and mining details—simply engulfed the scant hundred engineer officers. As the Corps was from time to time increased in numbers, it was never quite able to catch up with the increasing demands made upon it; and to the end of the war civilian assistant engineers and line officers are found engaged upon purely military engineer details. Often one finds the civilian engineers addressed as captain or lieutenant of engineers, when their names were never presented to the Senate for military rank. In some instances this may have been simply courtesy, and in others the engineer may have enjoyed rank by reason of a succession of *ad interim* appointments. In one instance, I have found an assistant engineer addressed as colonel, when his chief enjoyed only the rank of lieutenant colonel. Investigation showed, however, that he (John H. Gindrat) was entitled to this distinction by reason of a commission, which he held in that grade as aide-de-camp to the Governor of Alabama.

As a concrete example of the engineer shortage, let us take the condition at Vicksburg during the siege. The garrison was composed of thirteen brigades divided into four divisions. There were only four officers on the post with engineer commissions. One of the divisional commanders, Martin L. Smith, a provisional major general, it will be remembered, held the permanent rank of major in the Corps of Engineers. The garrison engineer, also chief engineer of the Department of Mississippi and East Louisiana, was Samuel H. Lockett, who had been jumped from brevet second lieutenant in the Corps of Engineers, U. S. A., to Captain, C. E., C. S. A., and who now held a temporary majority. Captain Powhatan Robinson, C. E., P. A. C. S., was the principal assistant engineer and Second Lieutenant George Donnellan, C. E., P. A. C. S., was in charge of the engineer depot. At his disposal Major Lockett had but one half-strength company of sappers and miners under

D. Wintter, who, together with his three lieutenants, was without confirmed rank in either the Regular or the Provisional Corps. The civil labor attached to the office of the department engineer consisted of one office engineer (B. H. Saunders), a draftsman (H. Ginder), seventy-two negroes under four overseers, three four-mule teams, and twenty-five yoke of draught oxen. The defenses of Vicksburg comprised a system of detached, raised field works (redans, lunettes, and redoubts) connected in most cases by rifle-pits, and protected from assault by abattis, palisades, ditches, and wire entanglements (composed of telegraph wire on pickets). To repair and extend these defenses required more than the capacities of this limited engineer establishment. Even the depot engineer and the draftsman were frequently in the field leading working parties. The latter on one occasion worked a week with a gang of convicts, constructing bomb-proofs for advanced ammunition dumps. To supply the deficit in engineer personnel, a qualified line or general staff officer—in some cases, a non-commissioned officer—was appointed in each brigade to act as assistant engineer, and similarly an acting engineer was added to the staff of each division commander. These acting engineers, who ranked all the way from colonel down to sergeant, seemed to have functioned very satisfactorily, for most of them were cited by Major Lockett in his final report of the siege. Three of them were later commissioned in the Engineers: J. J. Conway and A. W. Gloster, as captains and J. M. Couper, as first lieutenant. The casualties in the company of sappers and miners were First Lieutenant E. McMahon and Company Clerk William R. Goeble, wounded, and Sergeant W. N. Cole and Privates Hardy and Owens, killed. Lieutenant P. J. Blessing, one of the assistant engineers, was wounded. Eight of the negroes were wounded and nine killed.

Courtesy of J. P. Stratton

Battery on Vanderhorst's Wharf, Charleston

Siege Methods at Vicksburg

During the siege the opposing pioneers were in frequent contact with each other. The Confederates used hand grenades and fire balls (made of cotton steeped in turpentine) with great effect against the enemy's engineers. Mining and counter-mining engaged a large part of the engineer resources on both sides. On one day (June 25, 1863) a Union mine was exploded under a Confederate salient, burying five or six men, who were at the moment sinking a counter shaft. The same day, on another part of the line, two Confederate galleries were set off and completely destroyed the sap and parallels with which the Union engineers were enveloping a redan.

Increase in Provisional Corps

But let us return to the development of the Provisional Corps of Engineers. A captaincy was the highest rank provided. To get around this difficulty the War Department began to promote worthy officers in the artillery though retaining them in an engineering capacity. In this fashion Captain Victor von Sheliha rose to the rank of lieutenant colonel of artillery on assignment as district engineer at Mobile. The injustice of holding the temporary engineer officers (ninety-three in number) down to junior grades when there were only six regular officers available for field duties, was pointed out to Congress; which in September, 1862, authorized the regrading of the Provisional Corps of Engineers on the basis of one colonel, three lieutenant colonels, six majors, forty captains, thirty first lieutenants, and twenty second lieutenants. The War Department, however, proceeded slowly in making its promotions to the field grades and it was more than a year before the reorganization was completed. In response to further demands Congress, February 17, 1864, allowed twenty additional officers of the following grades: two colonels, one lieutenant colonel, two majors, and five in each of the junior grades. By the same act the Bureau of Engineers was allotted six military store-keepers with the rank of captains of infantry. Though these new authorizations were never fully procured, the Senate instructed its committee on military affairs, December 30, 1864, to inquire into the expediency of making increases in the number and rank of the officers in the Provisional Corps. The Chief of Engineers recommended an allowance of twenty-two additional officers. The result was Senate Bill No. 163, approved by the President March 2, 1865. As the Journal of Congress reveals nothing but the title of the bill, and as the laws of this, the last session of the Confederate Congress (Second Session of the Second Congress), have never been collected and printed, the exact increase is not ascertainable. It seems that the Chief of Engineers prepared a list of nominees, but it failed to reach the Senate before adjournment. The returns for February, 1865, carried one hundred and fifteen

Courtesy of Geo. S. Cook

A Sand-Bag Redoubt

officers in the Provisional Corps of Engineers and thirteen line officers attached thereto.

Advent of Engineer Troops

Following the Secretary of War's first urgent appeal for engineers, in December, 1861, Congress considered a bill to raise four battalions of pontoniers and a topographical corps; but did nothing about it. The refusal to create a separate body of topographical engineers was probably a very wise decision—at least, the United States found it desirable, the next year, to merge its two engineer corps. The war was half over before any adequate legislation on the subject of engineer troops was enacted.

In December, 1862, the Chief of Engineers submitted plans for the raising of four regiments of engineer soldiers. The men were to be drawn from troops then in service and selected for their skill in some branch of mechanical labor. "An intelligent class of officers to serve with the engineer troops can be selected," wrote Colonel Gilmer, "from the lieutenants, sergeants, corporals, and privates now in the line of the Army, and I think one of the greatest merits of the plan proposed is that promotion is thrown open at once to the meritorious men in the ranks or lower grades of the Army. The selections for service in the engineers should be made from the particular army or army corps with which they are intended to serve. This will guarantee a fair distribution of the promotions throughout the service and greater certainty of advancement for merit alone."

Without waiting for its recommendations to pass through the executive mill to Congress, the Bureau of Engineers at once began to prepare the trains that would be required by four thousand engineer troops. Congress acted with all reasonable promptitude; and on March 20, 1863, legislation was completed for the raising of one company in each infantry division and one troop of mounted engineers in each cavalry division. A little later an amendment added one engineer company for each twelve regiments not formed into divisions. The act provided for the regimenting of the engineer companies on the basis of the standard infantry regiment of the Regular Army. The headquarters consisted of one colonel, one lieutenant-colonel, one major, one adjutant with the rank of first lieutenant, one quartermaster sergeant, and one sergeant major. An amendatory act of February 17, 1864, added a second quartermaster sergeant. To this prescribed personnel existing law permitted the President to add two medical officers, a chaplain and a chief musician. Two companies of each regiment were to carry bridge trains and to serve as pontoniers. The company personnel consisted of one captain, one first lieutenant, two second lieutenants, eight sergeants, seven corporals, forty artificers, forty-five laborers, and two musicians. In addition each company, under the general law for the Army, was allowed four specially enlisted cooks, either negroes or partially incapacitated white men.

By comparing this outline of personnel with the tables of organizations of the Regular Army engineer companies of the Confederate Army we find that the experience of the war has taught the need of more man power and less rank. For the authorized number of first and second lieutenants has been reversed, and the number of privates and privates first class has been increased at the expense of the non-commissioned grades.

In the procurement of officers the elective method, generally in vogue in the emergency forces on both

COMPARATIVE TABLES OF ORGANIZATION

COMBAT ENGINEERS

(War Strength)

	Confederate Army		*U. S. Army*	
	Regular	*Provisional*	*Regulars (G. O. No. 54 1861)*	*Present (auth. Dec. 1920)*
COMPANY				
Captain	1	1		1
First lieutenants	2	1		2
Second Lieutenants	1	2		1
Total Commissioned	4	4		4
Sergeants	10	8	10	13
Corporals	10	7	10	12
Privates, first class	39	40	64	23
Privates	39	45	64	54
Musicians	2	2	2	2
Cook	1	1	....	1
Assistant Cooks	3	3	....	1
Total Enlisted	104	106	150	106
Aggregate	108	110		110*
REGIMENT				
Headquarters, etc., regimental and battalion:				
Colonel		1		1
Lieutenant Colonel		1		1
Majors		1		2
Captains		....		9
First lieutenants		1		....
Second lieutenants		....		1
Medical officers attached		2		5
Chaplain attached		1		1
Total Commissioned		7		20†
Warrant Officer		....		1‡
Sergeants		2		36
Other enlisted		1		134
Medical enlisted attached		....		16
Total Enlisted		3		186§
Companies		10		6
Aggregate:				
Total commissioned		47		44
Total warrant		....		1
Total enlisted		1,063		822
Grand total		1,110		867
Animals, public		220		297
Animals, private required of officers		47 to 106		....
Wagons, 4-line		20		42
Wagons, 2-line		10		7
Motor vehicles		....		42
Bicycles		....		15
Ponton trains		2		....

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*The engineer company before the World War (1916) consisted of 4 officers and 107 enlisted men. At the commencement of the war the enlisted strength was raised to 164 but was quickly increased to 223 men. One first and one second lieutenant were then added to the officer personnel. The decreases in 1920 were consonant with the general reductions throughout the Army.

†The pre-war total was 13 officers.

‡The warrant officer was the product of the World War.

§The pre-war enlisted total was 50 men. The increase is accounted for by the post-war creation of a "headquarters and service company".

sides was abandoned. The selection of officers was prescribed to be (1) by transfer grade for grade from the Corps of Engineers, (2) by transfer of officers from the line or General Staff, "reference being always had to their qualifications as engineers," (3) by appointment of duly qualified persons "now serving in or with the army", and (4) by appointment of military or civil engineers from civil life. Promotions were to be by seniority on the regimental list, "except in case of disability or other incompetency." The procurement of the enlisted personnel followed strictly divisional lines.

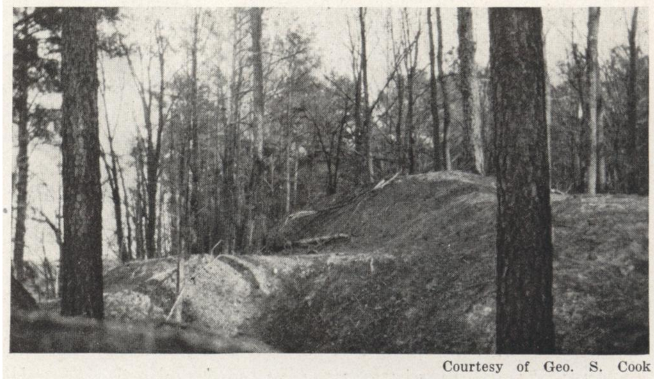
On the latter point and on the regimentation of the companies, General Lee crossed swords with the War Department. The organization of the engineer troops had begun under General Orders, No. 66, Adjutant and Inspector General's Office, dated May 22, 1863; but on July 17, 1863, under Special Orders, No. 176, the general suspended its operation in the Army of Northern Virginia, and ordered the men selected to be returned to their former companies. He admitted the value of engineer troops; but maintained that by keeping the engineers together by battalions and regiments, the divisional company would never be on hand when the division needed it.

To this objection the Secretary of War (James A. Seddon) promptly replied:

> Is this objection well founded? In order to give dignity to the service, as well as *esprit de corps* to officers and men, will it not be eminently proper, whenever the army is encamped for any length of time, and no immediate movement or attack anticipated, that the companies should be brought together regimentally? It seems to me it is only thus that the field officers can have sufficient control and influence; only thus in great emergencies, that these troops can be made to act harmoniously together in large numbers, and that they can ever be of service as armed soldiers.
>
> If they are to be kept simply and always in company organizations, subject exclusively to the orders of the major general commanding the division, the probability is great that they will rapidly degenerate into mere drudges, scarcely better than camp-followers, to be employed in menial service, burying the dead, etc. As a natural consequence, the better class of officers (and great efforts have been made to secure efficient and accomplished ones) will soon resign, rather than be attached to a non-fighting corps of very mediocre reputation.

The Secretary saw no reason why General Lee should not make such tactical disposition of the engineer companies, during a campaign, as the situation required. As a concession to the argument that the raising of the companies within the divisions constituted a subtraction from the fighting force, the War Department ordered that the companies should be recruited to half strength only from men then in service—in order to gain a measure of fire discipline—and that the remainder of the recruits should be drawn from conscription camps. In order to comply with the law, the conscripts were to be first assigned to the particular division and then transferred to the engineer company on divisional orders. To placate General Lee further, the Department permitted him to relieve his chief engineer from the duty of organizing the engineer units allocated to the Army of Northern Virginia and to assign this task to a lesser staff officer. T. M. R. Talcott, an aide-de-camp, with the Provisional rank of major of cavalry and the Regular rank of first lieutenant of artillery—between which grades he had held a temporary captaincy of engineers—was assigned to the duty of organizing the First Regiment Engineer Troops.

The difficulties being thus smoothed out, the Adjutant and Inspector General's Office, by General Orders, No. 104, Richmond, July 28, 1863, proceeded to outline the equipment to be issued to the engineers. The Ordnance Bureau was directed to furnish light arms in so far as they were available, otherwise regular infantry muskets; the Engineer Department to supply intrenching tools and other implements; and the Quartermaster's Department, to provide each company with at least two escort wagons with teams of four animals each for the transportation of company equippage and implements, one ambulance or other light vehicle with a team of two horses for carrying surveying, and drafting instruments and company records, and twelve combination horses, equipped with saddles and bridles for reconnaissances and with harness for hauling materials needed in the repair and construction of bridges, roads, and field fortifications.


Courtesy of Geo. S. Cook

Earthworks on Drewry's Bluff

The Regular Army Companies

The company of sappers and bombardiers was organized in the Mississippi Valley by Captain J. V. Gallimard. The company first shows up in the returns of the District of Mississippi at Grenada in June, 1862, with one officer and forty-one men present for duty. At this time it was indexed in the *Official Records* as a company of Louisiana Engineers, but subsequent references prove that this company belonged to the Regular Army. No record of a commission shows for Captain Gallimard until he was nominated on February 6, 1864, to be captain "of the company of sappers and bombardiers, authorized by act of Congress approved May 17, 1861." He was confirmed on February 16, 1864, to rank from May 17, 1861. In the meanwhile, Captain Gallimard's company had been transferred to the Army of Mobile after the disasters at Vicksburg and Port Hudson. On the return from these headquarters, the company is described as the "company of sappers and bombardiers." In the summer of 1864, it was assigned to the defenses of the Lower Bay Line, which included Forts Morgan, Grimes, and Powell, the works on Little Dauphin Island and Cedar Point, and the channel obstructions. After the Battle of Mobile, Captain Gallimard, who had been captured by the Union Army, was commended by the commanding general for satisfactory performance of duty.

The history of the company of sappers, miners, and pontoniers is not so simply traced. The Chief of Engineers in a communication to the Secretary of War, dated December 26, 1862, said: "As yet our armies are without regularly organized engineer troops. Two or three companies of men only have been formed by selecting them to do the duties of engineer troops." An examination of the field returns for 1862, published in the *Official Records* shows four companies or detachments of "sappers and miners," in addition to Captain Gallimard's. Of these, three are indexed as state troops and one as Confederate; and they are referred to only by the names of their commanding officers. Two companies of Louisiana engineers were carried on the return from Fort Pillow, Tennessee, as Ryan's Engineers. A company of Tennessee Engineers was carried on the returns of the Department of East Tennessee as Margrave's company of sappers and miners. The returns for May 31, 1862, showed Margrave (Geo. R.) as a lieutenant but those for June 30, 1862, gave him as a captain. However, Margrave's name was not presented to the Senate for any commission until June, 1864, at which time he was confirmed as a first lieutenant in the 3rd Engineers to rank from April 30, 1864. At the close of 1862, his company was stationed at Cumberland Gap, attached to the First Brigade. The returns for February, March, and April, 1863, showed the company, now under Captain E. Winston, attached to the Fourth Brigade, successively at Watauga Bridge, Strawberry Plains, and Jonesboro. Winston, like Margrave, did not hold a Confederate engineer commission until he was confirmed as a captain on the organization list of the 3rd Engineers, May 10, 1864. In May, 1863, the company was shown on the Department's returns as unbrigaded. By the following fall it had passed to Captain A. W. Clarkson, attached to the 3rd Engineer Regiment as an independent company of sappers and miners. Clarkson was never commissioned as an engineer officer. At the beginning of the war he raised a battery of Arkansas artillery and during the Battle of Shiloh served as an acting aide-de-camp to Lieutenant General Hardee.

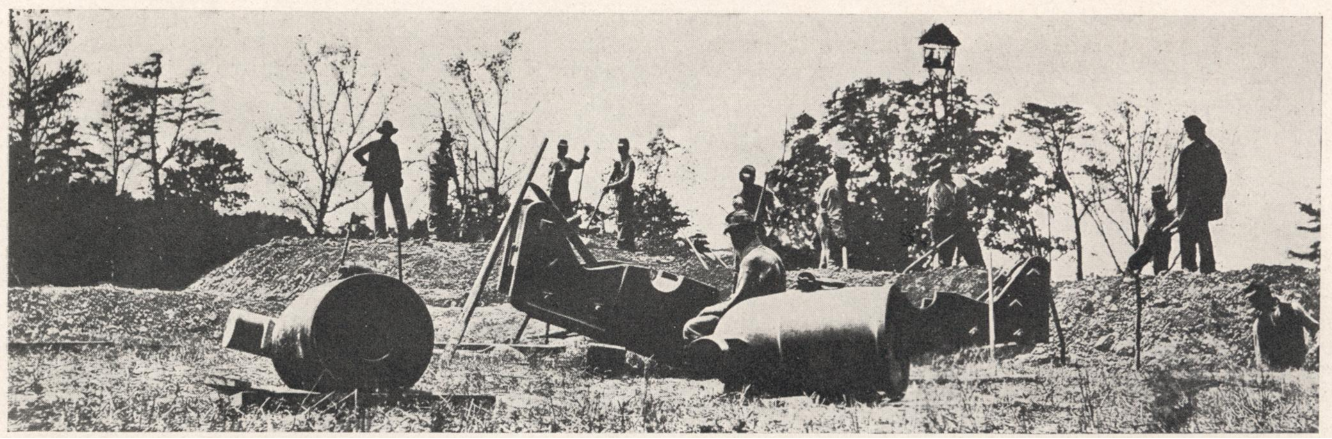
The company, indexed as Confederate, was under the command of D. Wintter and was located at Vicksburg as we have already seen. While it does not show up in the returns until July, 1862, there are references which indicate that it had been on duty in the District of Mississippi since the first of that year. After the fall of Vicksburg, the company was sent to Demopolis, and there began the manufacture of ponton equipment.

Upon the organization of the 2nd Engineers, Captain Wintter was appointed a major in that regiment. The identity of his old company is then lost. It may have been taken into the 2nd Engineers as Company B. The returns of the Corps of Engineers and the engineer troops in the Department of Alabama, Mississippi, and East Louisiana on November 1, 1864, show a detachment from the company of sappers and miners, consisting of two officers and eight non-commissioned officers. All through the *Official Records* one finds references to detachments of the company of sappers and miners—I do not believe that I have seen the full name "sappers and miners and pontoniers", however. But it seems impossible to put one's finger definitely on the company. I would be inclined to accept the Tennessee company as the Regular Army company, but for the fact that it seems never to have been commanded by an officer of the Corps of Engineers as provided by law. During the first half of the war when there were no engineer troops to speak of, the commanding generals had frequently designated certain companies as divisional pioneers, and the Margrave-Winston-Clarkson company may have been of that variety.

While its identity can not be fixed with certainty, I am convinced that the company of sappers, miners, and pontoniers, authorized on March 6, 1861, was actually in service.

(*In a future issue the writer will discuss the histories of some of the engineer organizations formed by the Confederacy.—Editor.*)

Brady



Mounting Siege Mortars near Petersburg

Brady

The Confederate Engineers

William M. Robinson, Jr.
Major, Corps of Engineers Reserve

As we have seen, the engineer troops in the Confederate Armies were very informally organized during the first two years of the war. Nevertheless, the successful operation of the armies would seem to argue that the engineer functions must have been discharged with a reasonable degree of efficiency. In probably no corps were the pioneer troops more informal and rule-of-thumb than in Stonewall Jackson's. Yet there are numerous legends about the effectiveness of his pioneers—tales which would shame the accomplishments of the most manual-perfect engineer troops of any army.

The organization of the four regiments contemplated in the plans of the Chief of Engineers was promptly begun in the summer of 1863; but the lists of officers were not presented to the Senate for confirmation until the spring of 1864. An examination of these lists shows that all of the commanding officers except one, and many of the company commanders, were taken from the Provisional Corps of Engineers. As a rule the officers of these regiments were capable engineers, and many of their names can be found on the roll of deceased members of the American Society of Civil Engineers.

Procurement of Officers

These regiments became, to all effects, regular troops; and were often referred to as such in official communications. It was the manner in which they were raised that distinguished them from the other emergency troops. In the line troops, the initial complement of officers, from second lieutenant to colonel, was elected by the troopers; and, if found reasonably qualified, the electees were commissioned by the President. Promotions were by seniority, with vacancies in the lowest grade again filled by election. The men, whether volunteers or conscripts, were generally all from the same locality. It is easy to see the consequences—loss in discipline through familiarity, and popularity rather than ability as the controlling factor in the election of officers. However, there were ways of getting rid of officers who proved incompetent; and the War Department was not at all backward in dropping them, asking for resignations, or even in dismissing them. Then, too, there are frequent records of electees being refused; and other persons, even outside the unit, being appointed. But, on the other hand, with the officers carefully selected by the War Department and with the men themselves selected and coming from different localities, the engineer regiments of the Provisional Army started out with the fundamental conditions of the Regular Army.

First Engineers

The headquarters of this regiment were established at Richmond. Major Talcott was soon detached permanently from General Lee's staff and made regimental commander, being promoted first to lieutenant-colonel and then to colonel. He carefully chose his officers and men, not only for technical skill but for ability as soldiers. He secured orders from the War Department (S. O. 189, A. & I. G. O., August 10, 1863) permitting him to hand pick his quota of recruits at the conscription camps. This was to be the *crack regiment* of the Army.

No sooner had the regiment taken on some semblance of strength—December, 1863—than the commander of the local defenses of Richmond requisitioned it for road repairs. However, the Chief of Engineers stepped in and prevented this interruption of the organization and training schedule, saying that the work in question was properly a job for negro laborers. By February, 1864, the regiment had attained a high state of efficiency, and was put on guard duty at the several prisons in Richmond. In April, reinforced by two companies from the 2nd Engineers, it joined the Army of Northern Virginia.

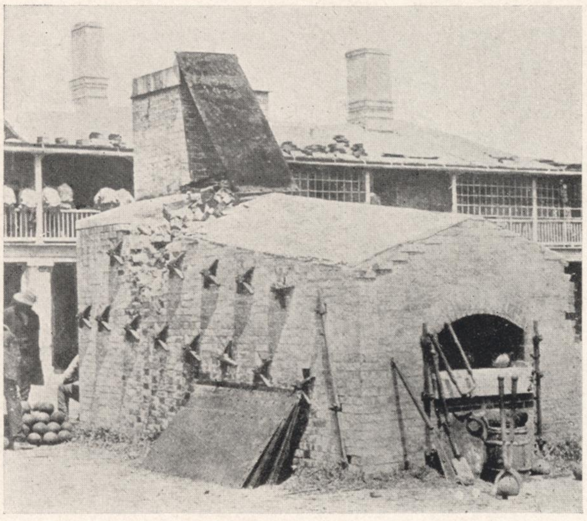
At this time, General Lee already had six pioneer companies besides a relatively large number of staff engineers. In fact he had the largest engineer force ever assembled under a single Confederate commander. Accordingly, he felt that his chief engineer should be a general officer, and advised the War Department that "any good officer, bold, energetic, and intelligent" would suit him. "Among the advantages of having a general officer as chief engineer," urged General Lee, "is that he may exercise authority over the troops engaged in engineer constructions on which the whole army is at times employed." Whereupon, the President promoted Colonel Stevens, then chief engineer, to be a brigadier-general.

In order to break the new engineers into combat service, they were first used to guard the supply depot at Orange Court House and then as a support to a cavalry brigade which occupied a part of the extreme right in Spotsylvania county. By midsummer the several companies were distributed along the entire front engaged in all kinds of military engineer work. When the situation became critical in March, 1865, the main body of the engineer troops were put into the trenches as infantry.

Second Engineers

This regiment was never brought together. Its companies were scattered from Virginia to Alabama. Company A was organized at Wilmington by Lieutenant John C. Winder, C. E., P. A. C. S., who was promoted to be captain of engineer troops. It was recruited to full strength by October, 1863. Companies B and C were from Alabama. The latter was located at Mobile under Captain L. Hutchinson. Company D was organized in Georgia in the Fall of 1863 by Captain J. W. McAlpin. Company E was a Charleston company and was commanded by Captain R. M. Stiles, who was promoted from first lieutentant in the Provisional Corps. Lieutenant B. M. Harrod, who as Provisional engineer had been cited for high professional services at New Orleans in 1862, was made captain of Company G. Captain John Howard had Company H.

There were two engineer companies at Demopolis, Alabama, engaged in building ponton trains, until the Army of Mississippi moved into Georgia in May, 1864, to consolidate with the Army of Tennessee in front of General Sherman. These companies were commanded by Captain W. A. C. Jones and Captain John A. Porter. Jones was commissioned in the 2nd Engineers. His company was probably Company F or I. Porter's name was never presented to the Senate, but his company was probably the remaining unaccounted for company of this regiment. The only field officer appointed in the 2nd Engineers was Major D. Wintter, who in September, 1864, was stationed at Meridian, Mississippi.


Courtesy of J. P. Stratton

The Shot-heating Furnace at Fort Moultrie

Third Engineers

The Third Regiment, Engineer Troops was organized principally in the Army of Tennessee, of which Brigadier General Danville Leadbetter was chief engineer. Major S. W. Presstman, C. E., P. A. C. S., was the guiding spirit; and was made lieutenant-colonel and regimental commander. His second in command was Major J. W. Green. In the Summer of 1864, Company A, Captain R. C. McCalla was assigned to Buckner's Division; Company B, Captain H. N. Pharr, to Cheatham's Division; Company C, Captain A. W. Gloster, to Stewart's Division; Company D, Captain Edmund Winston to Buckner's Division; Company F, Captain W. A. Ramsay, to Cleburn's Division; and Company G, Lieutenant Robert L. Cobb, to Hindman's Division. Company E, Captain William T. Hart, was allocated to the Department of Western Virginia and East Tennessee, when the regiment was organized in the fall of 1863. Company A was transferred to this department also during the fall of 1864.

The Engineers were thrown into the line during the siege of Atlanta. The casualties were presumably large; for on July 29, 1864, we find General Hood ordering the conscript depot at Macon to send up two hundred replacements to the 3d Engineers. The last returns of the Army of Tennessee, dated April 17, 1865, show the Engineers to number three hundred and seventy-one effectives. The make-up of this total is not available; but it was probably composed of fragments of both the 2d and the 3d Engineers.

First Mounted Engineers

The First Battalion Engineer Troops (Mounted) was a Trans-Mississippi outfit. Lieutenant Colonel Henry T. Douglas, formerly Major, C. E., P. A. C. S., was the commanding officer. Nine troops were mustered into service and the tenth was said to be in process of organization at the end of the war. Only six captains were nominated for this organization. The troop which accompanied Price's Expedition into Missouri was commanded by a first lieutenant. Two companies were stationed on Galveston Island, one of which was commanded by a second lieutenant. For administrative purposes the battalion seems to have been attached to the Cavalry Corps (4th Army Corps of the Trans-Mississippi Department)—which was composed largely of Indian regiments. It was treated, no doubt, as army troops. The battalion headquarters in August, 1864, were at Alexandria, Louisiana.

First Foreign Battalion (Engineers)

Unlike the Union Army, the Confederate forces contained no appreciable element of foreigners. The Corps of Engineers in the Continental Army had been composed mostly of Frenchmen and Poles; but no foreigner was admitted to the Corps in the Regular establishment of the Confederacy, and only one was appointed in the Provisional establishment. This officer was Jacques Nocquet, of France, first a captain, C. E., P. A. C. S., then a major, and finally dropped in 1864 as a deserter. In the Engineer Troops there were commissioned one Canadian and some half a dozen officers from the North. At the very end of the war one regiment of foreigners was enlisted for engineer service under Southern officers.

With the refusal of General Grant to exchange prisoners during the last year of the war, the Confederate prison camps were filled to overflowing and constituted a serious burden upon the dwindling resources of the country. Among the prisoners of war there was a very large foreign element which really cared very little for the issues of the conflict. The solution was obvious: to enlist the mercenaries under the Confederate banner. The organization of units made up entirely of prisoners of war was considered a hazardous experiment by the War Department and by the several generals with whom it corresponded on the subject. Nevertheless, an experimental battalion was formed; and a list of officers was presented to the recruits for their election. They meekly accepted the nominations and were mustered into service as an ordinary volunteer Infantry outfit. It was not very long before a conspiracy was uncovered, and the battalion was promptly disbanded. The War Department then instructed that when prisoners of war were received as recruits, they should be distributed individually or in small numbers among companies of undoubted fidelity. However, there were some officers who believed that if the recruiting officers were accompanied by Catholic chaplains a number of faithful soldiers might be picked up at the several prisons. Accordingly, in January, 1865, the Secretary of War modified his instructions so as to permit battalions to be raised of Catholic prisoners of Irish and French nationality. In February, 1865, the Adjutant and Inspector General directed Lieutenant Colonel Julius G. Tucker to recruit the First Foreign Battalion for engineer service upon the infantry tables of organization. Tucker lost no time in raising his battalion from the prisoners held in the Department of South Carolina, Georgia, and Florida. The success of his recruiting was so immediate that before the end of February he was promoted to be colonel and was authorized to enlarge his battalion into a ten-company regiment. The regiment reached a strength of over six hundred men and was with General Johnston's Army at the surrender in April, 1865.

Brady

Hasty Entrenchments at New Hope Church

Labor Troops

In its negro population the South possessed an abundant source of labor. The problem was how to marshal it for the purposes of war. In the summer of 1861, the War Department declined several tenders of negro combat troops. At this time there was no difficulty in hiring all the slaves that were needed for labor upon the public works. In the first wave of war patriotism, the Government could have had anything that the citizens possessed. But when harvest time came around, negroes and teams were needed on the plantations and in the Fall of 1861 we begin to find talk of *impressing* teams and negro teamsters. Some of the States, notably Tennessee, had already foreseen this situation, and had enacted laws for the pressing of free male persons of color into war service as menials. A circular from the Quartermaster General's Office, November, 1861, cautioned that: "Impressments must not be resorted to except when absolutely demanded by the public necessities, and their burden must be apportioned among the community, as far as may be possible, equally and impartially, having due regard to the means and ability of owners of property."

Brady

Battery Position near Atlanta

As can well be imagined, this soon became a sore point. For example, when General Mercier impressed a large number of plantation negroes for work upon the defenses of Savannah during the summer of 1862, a great howl went up from the planters, through political channels to Richmond, that they were being discriminated against. They said that the general should have taken the slaves employed upon the railroads. The railroad negroes were accustomed to construction work and were better suited as military laborers. They said that railroad maintenance could wait but that corn and fodder could not. That they had given up cotton crops in order to raise corn and provisions for the army, and now just as every negro was needed to make the crop the Government took them.

In consequence, President Davis, November 26, 1862, addressed the several governors on the subject of uniform state legislation governing the impressment of private property in the prosecution of the public defense. South Carolina promptly passed an act "to organize and supply negro labor for coast defense in compliance with requisitions of the Government of the Confederate States." Louisiana and Mississippi followed suit and Virginia amended her existing law. In March, 1863, Congress sought to clarify the situation and passed an act to regulate impressments. This act, together with the War Department's instructions respecting it, was promulgated in General Orders, No. 37, A. & I. G. O., April 6, 1863. In carrying the act into effect much resistance was developed, especially in Georgia, where the Legislature passed a resolution declaring that the law had been "greatly perverted and violated by the impressing officers."

On October 24, 1863, the War Department issued new and fuller orders (G. O. No. 138, A. & I. G. O.) in respect to the impressment of slaves. Labor on fortifications and other public works was to be secured by contract if possible; but "the commanding general or the officer of engineers in charge of the work shall have power to decide upon the necessity for making impressments of slaves." The age limits of impressed slaves was fixed at seventeen to fifty years. No slaves were to be impressed from domestic service or on plantations devoted exclusively to the production of grains and provisions, except in cases of great urgency. No slaves would be taken from holders of less than four male slaves of impressible ages. Not more than 5 per cent of the slave population of any county would be taken at one time, except by consent of the Governor. All requisitions must be fairly and equitably apportioned throughout the section. The period of service was prescribed as sixty days, except in case of default, when the owner was penalized by an additional thirty days of service for the first five days in default and ten days for each subsequent day's delay. The compensation was fixed at $20 a month except to defaulters, who were to receive only $15. Rations and medical attention were furnished to the slaves. Indemnity was guaranteed to the owners for all losses occasioned by the enemy or arising from negligence on the part of the Army. On February 12, 1864, G. O., No. 20, permitted impressing officers to meet the market rate for labor.

These regulations did not prove a solution of the problem of providing a sufficient and dependable source of military labor, so Congress passed an act, approved February 17, 1864, authorizing the organization of labor troops to be composed of free negroes and slaves of ages, eighteen to fifty years. The former were to be given the pay and allowance of a private of infantry; that is, $11 a month, rations, medical attention, and clothing; and were to serve for the duration of the war. The term for slaves was twelve months. The owners of slaves were to be compensated at the prevailing impressment schedules. Not more than one-fifth of any owner's able-bodied men should be taken without his consent. The mulattoes who were free persons of color under the terms of the Louisiana Purchase and the Florida Cession were exempted from conscription by reason of treaty obligations.

Libby Prison, Richmond

Courtesy of Geo. S. Cook

On March 19, 1864, the Bureau of Conscription issued Circular No. 9, directing the enrollment of all negroes subject to the act. The law permitted the impressment of as many as twenty thousand slaves. Of this number the Secretary of War (James A. Seddon) allotted six thousand to the Trans-Mississippi Department; and directed General E. Kirby Smith, commanding that department, to begin the organization of labor troops. There are no returns available. The Bureau of Conscription sent out Circular No. 60, September 7, 1864, calling on the enrolling officers for returns of all free negroes and slaves taken into the service up to September, with a statement of their assignments.

It is doubtful that the raising of negro battalions proved an easy job. During the next few months the bulk of negro labor was gotten up under the old short-time impressment method. As late as September, 1864, the War Department (S. O., No. 224) directed the impressing of five thousand slaves for thirty days' service with the Army of Northern Virginia. When the evacuation of Atlanta by General Hood made the hurried fortification of Augusta necessary, Captain L. P. Grant, the engineer in charge, advertised for one thousand negroes at $40 a month, whereas $25 was the prevailing rate for slaves in the labor troops. His advertisement ran for six weeks without getting an adequate response. Then Sherman began to move from Atlanta (November 15, 1864) and the Augusta district went into a panic. A levy of five thousand slaves was made on the adjoining counties in Georgia and South Carolina by the district impressment officer; and the situation was relieved.

On December 5, 1864, the Adjutant and Inspector General issued G. O., No. 86, directing that the twenty thousand slave troops be brought into service with the utmost dispatch. A week later the Bureau of Conscription, in Circular No. 36, announced the slave quota of the several states, as follows: Virginia and North Carolina, two thousand two hundred and fifty each; South Carolina, Georgia, and Alabama, two thousand five hundred each; Florida and Tennessee, five hundred each; and the District of Mississippi and East Louisiana, one thousand five hundred; a total of fourteen thousand five hundred troops.

On December 23, 1864, the Legislature of South Carolina passed a law which so hampered the process of slave impressments as to amount to a nullification of the slave-labor acts of Congress. The Superintendent of Conscription (Brigadier General John S. Preston) in an unofficial note to the Secretary of War dated Columbia, South Carolina, December 29, 1864, refers to the legislation as treason, and waxes eloquent over the "folly and wickedness of Governors Brown and Vance." In another letter to the Secretary, two weeks later, General Preston reported that he believed it to be impossible to raise labor troops, adding that: "A regiment of cavalry with bloodhounds in every county in the Confederacy would not obtain the slaves unless by the intervention and use of state laws and state authorities." He recommended as a remedy the passage of an act by Congress to authorize the War Department "to negotiate with the States for the impressment of slaves on such terms as may be agreed." The communication was referred to the Chief of Engineers for comment. General Gilmer returned it with his concurrence on February 1, 1865, and four weeks later the President approved a new labor troop bill. This act reduced the age limit from fifty to forty years; but increased the quota of slaves from twenty thousand to forty thousand. The Secretary of War, and the commanding general in the isolated Trans-Mississippi Department, was practically given *carte blanche* in the procurement of free negroes and slaves. The Governor of Virginia took prompt steps to supply his state's quota. But it was too late!

Courtesy of Geo. S. Cook

Breastworks at Fredericksburg

Organization of Labor Troops

The organization devised for the labor troops was unique. Each company or "gang" consisted of one hundred negroes, under a "manager" and two "overseers," with four of the best negroes selected as "foremen". Eight gangs constituted a "section" under a "superintendent"; and three sections, a "force" under a "director". On the staff of the director were two clerks and a purveyor. The latter was charged with quartermaster and commissary duties. At the headquarters of each section there were one clerk, an assistant purveyor and a medical officer. Thus the section or battalion consisted of eight hundred negroes and twenty-eight white men; and the force or regiment of two thousand four hundred negroes and eighty-eight white men. A field officer in the office of chief engineer of each army or department was placed in general charge of the force allotted to that army or department.

The negroes were collected at the conscript camps, where the usual descriptive lists were made out. The value of the slave, and of his clothing, was entered on his service record. Boards of appraisal settled any dispute between the owner and the enrolling officer as to values. The negroes were then forwarded under guard to the rendezevous in groups of fifty to one hundred, where they were assigned to gangs and mustered into the service by a field officer in the same manner as with other troops.

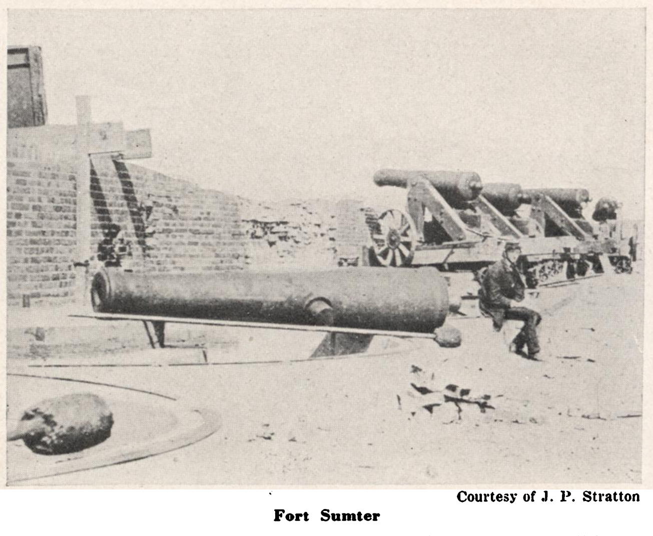
The instructions of the Bureau of Engineers enjoined that:

> Every effort will be made to induce contentment in the slaves. Their discipline will be considerate and mild for minor offenses. Cases of grave character will be forwarded for the determination and instructions of the chief engineer of the army or department, who will in the meantime prepare and submit for the approval of his commanding general a code for the government of managers and others in charge of the slaves.

The instructions further enjoined that no manager or overseer should be appointed without careful investigation of his qualifications and past experience in the management of negroes on plantations or civil improvements.

Comparison with the United States Engineers

The first expansion in the engineer establishment of the United States Army was authorized in August, 1861. The Corps of Engineer troops were then increased from one company to a battalion of four companies; and the Corps of Topographical Engineers was allotted its initial company. The recruiting of the latter company was begun at Boston; but after only ten recruits had been secured it was abandoned, and those men were transferred to the Engineer Battalion. The War Department returns for December, 1861, show that, though the military establishment had been expanded to forty times its peace strength, only the original company of engineers was yet in service. The battalion was not completely organized until the summer of 1862.



Courtesy of J. P. Stratton

Fort Sumter

The photograph was taken in April, 1861, and shows the condition of the parapet at the time of the surrender of the fort by Major Anderson

The 15th and 50th New York Volunteers were taken under the wing of the Engineer Battalion and instructed in engineer duties. These regiments then became the 15th and 50th New York Volunteer Engineers; and, during the Peninsula Campaign, were brigaded under Brigadier General Henry W. Benham, with an aggregate strength of about two thousand men.

There were four other volunteer engineer regiments in the Union service: the 1st Missouri Engineers, the 1st New York Volunteer Engineers, the 1st Michigan Engineers and Mechanics Regiment, and the 1st United States Veteran Volunteer Engineer Regiment. In addition one finds occasional references to companies of volunteer engineers; as: "Brown's sappers and miners," "The First Pontioners," et cetera.

As the Union armies penetrated the South, many negroes were corralled into the *Corps d'Afrique.* Five engineer regiments, the First to Fifth, inclusive, were organized; but were later changed to be the 95th to 99th United States Colored Infantry, respectively.

Neglecting the colored increment, the United States Engineers stood one battalion of regulars against the two companies of regulars in the Confederate establishment; and six regiments of volunteers against the four regiments in the Provisional Army of the Confederate States, plus the one belated regiment of foreigners. To background this comparison: the present and absent strength of the United States Army at the end of the war was slightly over one million men; and about two million and three-quarters were first and last under United States colors. The Confederate Army at no time quite reached the half-million mark. Its high point was attained in the Spring of 1863, with an aggregate present and absent of four hundred and eighty-nine thousand, one hundred and sixty-nine officers and men, of which only three hundred and four thousand, two hundred and thirty-six were present for duty. The Confederate War Department's estimate for the first half of 1865 contemplated four hundred thousand men (five hundred and eighty-two Infantry regiments, one hundred and four Cavalry regiments and two hundred and forty batteries of Artillery); but when the debâcle came in April-June, 1865, the army had been reduced well below two hundred thousand men—though the Confederate Engineers were then at just about their highest point of organization.

Incidentally, let us test the adequacy of the Confederate engineer establishment on the basis of one engineer company to each twelve regiments. The First Mounted Engineers with nine companies is correct for the one hundred and four Cavalry regiments authorized for 1865. The five hundred and eighty-two Infantry regiments would call for forty-nine companies or five regiments of Engineers, whereas only four regiments (including the foreign unit) were organized. But, in a true appreciation, some allowance should be made for the labor troops and for the failure of the line troops to equal the authorized strength. Really, considering these points, the strength of the Confederate Engineers must be rated above par.

Courtesy of J. P. Stratton

Fort Moultrie

The photograph was taken in April, 1861. The sand bag and palmetto log revetments installed by the South Carolina Engineers have suffered little from the fire of Major Anderson, in Fort Sumter.

The State Engineer Corps

During the interegnum of the Union and the Confederacy several of the states established rather complete military organizations, notably Virginia and both the Carolinas. These states not only authorized an army and a navy but actually put regiments in the field and ships in commission. Their armies included a corps of engineers. Colonel Andrew Talcott (an officer of the Corps of Engineers, U. S. A., 1818-1836) was chief of the Virginia Corps, which included at least one company of sappers and miners (Captain N. Carroll). A few of the state engineer officers were promptly recommissioned in the Corps of Engineers of the Confederacy, but not always in the same grade. For instance, Major G. W. C. Lee of the Virginia Engineers was reduced to a captaincy. Later, after the Provisional Corps of Engineers was authorized, the bulk of the state engineers were given Confederate provisional commissions; but usually one grade lower, as, John C. Winder of North Carolina, captain to first lieutenant and Francis D. Lee of South Carolina, major to captain. But Bushrod R. Johnson of Tennessee, vacated a colonelcy of engineers to become a Confederate brigadier general. However, some of the state engineer officers remained in the state service. Major Walter Gwynn, Corps of Engineers, South Carolina Army, was Beauregard's chief engineer at Charleston in the spring of 1861. While he was never recommissioned in the Confederate corps, he appears to have continued on duty in various capacities. In April-May, 1861, he was a major general of Virginia Volunteers, commanding at Norfolk. In May-June, 1861, he became a brigadier general, North Carolina Army, commanding the Northern Department of the state. Then in April, 1863, he appears in the report of the chief engineer of the Army of Northern Virginia as a colonel, corps unstated. Colonel Talcott remained at the Virginia Bureau of Engineers until 1862, when he resigned and went to Mexico to resume his former position as chief engineer on the Vera Cruz Railroad.

Bureau of Engineers

The Bureau of Engineers was not organized until April 8, 1861, when Major Josiah Gorgas, Artillery, was assigned to duty as Chief of Ordnance and Acting Chief of Engineers. The seat of government was at that time in Montgomery, Alabama. In June the Government moved to Richmond. On August 3, Major Danville Leadbetter, C. E., C. S. A., became acting chief. He surrendered office to Captain Alfred L. Rives, C. E., P. A. C. S., on November 13, 1861. Captain Rives received a permanent appointment and held office for nearly a year, yielding to Lieutenant Colonel Jeremy F. Gilmer, C. E., C. S. A., on September 18, 1862. Gilmer was promptly advanced to be a colonel in the regular establishment. In August, 1863, he left the Bureau to take the field with the temporary rank of major general of volunteers. His predecessor (Rives) had now attained the rank of lieutenant colonel, and was returned to the Bureau as acting chief. In the spring of 1864, Major General Martin L. Smith administered the office for one month during the absence of the acting chief. Rives, who in the meantime had been promoted to a full colonelcy, again gave up his office to Gilmer in June, 1864; but remained in the Bureau as Assistant Chief of Engineers. In returning to the Bureau, Gilmer retained his temporary rank as a major general, by virtue of an act of December 31, 1861, which authorized the President to confer temporary rank on officers on duty in certain bureaus.

Colonel W. H. Stevens, C. E., C. S. A., was in charge of the construction branch in 1863; and, in 1864, Major James H. Alexander, Adjutant General's Department, was in charge of personnel and records.

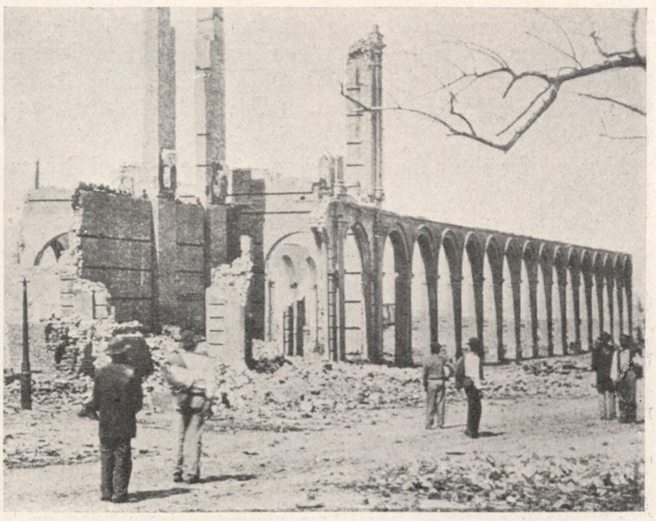
Appropriations

The Confederate Congress early recognized the impracticability of adhering strictly to estimates in the expenditure of appropriations; and on May 14, 1861, enacted that money appropriated for a particular branch in one department might be applied to another branch in the same department. In such cases, special accounting of the transferred money should be laid before Congress at the next session. The first special appropriation for the engineer service was made on December 24, 1861, in the sum of $134,000. This was to cover the year ending February 18, 1862. The appropriations for the support of the government from April 1 to November 30, 1862, included $1,800,000 for engineer work. The appropriations for December, 1862, included $200,000 for the engineer service, with $800,000 to cover the engineer deficit; for January, 1863, $500,000; from February 1 to June 30, 1863, $3,000,000; and from July 1 to December 31, 1863, $6,000,000. In each six-month period thereafter the engineer expenditures were fixed at $10,000,000. Special appropriations were made, on estimates of the Chief of Engineers, to compensate the owners of slaves lost upon public works, either by death or escape to the enemy. On the estimate of January 22, 1864, $3,108,000 was appropriated; and on that of September 30, 1864, $1,500,000. Thus the total appropriations from the Confederate treasury for engineer service amounted to $48,042,000.

The authorized expenditures for engineer service equalled about 2¾ per cent of the total War Department requisitions ($1,737,746,121.83 to February 1, 1865); but the Engineers, exclusive of labor troops, constituted hardly more than 1 per cent of the personnel of the Regular and Provisional establishments.

Procurement of Supplies •

Engineer workshops for the manufacture and repair of engineer tools and equipment were established at Richmond, Charleston, Augusta, Mobile, Demopolis, Gainesville (Alabama) and in the Trans-Mississippi Department. Intrenching tools were generally purchased abroad and run through the blockade; but there was a considerable quantity of wheelbarrows, picks, axes, and spades manufactured in the Government shops. In February, 1863, Captain John M. Robinson C. E., P. A. C. S., was sent to England as purchasing agent for the Bureau of Engineers. He was also permitted to act as agent for several of the leading railroad companies. He returned to the Confederacy in September, having accomplished his mission with reasonable success. To pay for his purchases £12,000 was allotted from the Erlanger Loan.


Courtesy of J. P. Stratton

Ruins of the Northeastern Railroad Depot at Charleston

Ponton Bridges

During the first year and a half of the war there was not a ponton train in the Confederate Armies. In 1863, the Bureau of Engineers went to work in earnest to remedy this deficiency by contract and by work in its own shops. During 1864-1865 there seems to have been no shortage in any of the armies. The Confederate ponton material was constructed upon the plans and specifications developed by the United States Army during Jefferson Davis' administration of the War Department.

In the Summer of 1864, when the enemy was withdrawing his forces from the Trans-Mississippi, apparently for a concentration on Richmond or Mobile, the War Department directed General E. Kirby Smith to cross the Mississippi and frustrate this eastward movement. It was a very daring scheme and worthy of a bold, energetic commander. Smith believed it to be impracticable and a prolonged wrangle followed. As late as January 31, 1865, President Davis was still trying to get General Smith to cross the Mississippi and create a diversion in Sherman's rear.

While the argument was in progress, Lieutenant Colonel Henry T. Douglas, commanding officer of the First Mounted Engineers, was enthusiastically preparing ponton material for a mammoth bridge across the Mississippi River in order that the Army of the Trans-Mississippi might cross over *en masse* and so retain its organization and usefulness. He held that the importance of relieving the pressure on Hood in Georgia was sufficient to justify any sacrifice. On August 4, 1864, he formally submitted his plan for crossing the river. He suggested that a feint be made on the Union forces in Missouri or lower Louisiana. In the meantime he would quickly assemble the ponton material at a bridge site whose location had been kept absolutely secret. He would cross over half the materiel ferrying over a large force to organize a *tête de pont*. The bridge would then be swung into place by sections from both sides simultaneously. Large boats were to be anchored 60 feet above the axis of the bridge at intervals of 150 feet. A hauser passed over these boats would serve as a mooring line to attach the ponton cables. The men in the anchor boats were to be especially equipped with fire fighting apparatus as security against fire rafts. Heavy artillery was to be stationed at the bridge-head and at points half a mile above and below it. The decision of General Smith not to cross the river cost the science of military engineering a most valuable experiment, for no ponton bridge of such magnitude has been undertaken since Xerxes built a bridge of boats across the Hellespont during the Graeco-Persian War. Incidentally, a review of the United States naval records indicate that the disposition of the Mississippi Squadron was not such as to have seriously jeopardized the success of Colonel Douglas' plan.

The topographical work in the several territorial departments was carried on by topographical sections organized in the department engineer's office. Usually a captain or major of the Provisional Corps was in charge, assisted by one or two lieutenants and a small force of civilian engineers and draftsmen. A number of the maps prepared by these topographical parties have been reproduced in the atlas of the *Official Records*. They exhibit a high degree of finish and care in details.

In 1864, the reproduction of maps for field purposes by a photographic process was begun.

The floating equipment belonging to the United States Engineer Department in southern harbors at the time of secession fell into the hands of the Confederate engineers. This initial outfit was enlarged from time to time by purchase and charter, and in some instances of great urgency by impressment of blockade-runners (with payment afterwards). The river and harbor work was both positive and negative. That is, it consisted in blocking up channels as well as the usual peace time procedure of keeping them open.

No list of the Bureau of Engineers steamers is available; but as an example, at Galveston, in 1863, the Bureau owned the *Colonel Stell* and had under charter the *Grand Bay*. At Savannah, the sternwheel dredge *Habersham* was in service.

Engineer Work on the Railroads

In order to provide a continuous trunk line, with parallels at exposed points, from Texas to Richmond, the Confederate Congress appropriated several million dollars to be lent to certain railroads for construction purposes. It was usually provided that the money was to be expended under the general supervision of the Bureau of Engineers. The gaps existed in Louisiana, Alabama, South Carolina, North Carolina, and Virginia. Construction work on all of them, save one, was in progress at the beginning of the war. The exception was the link missing between the terminus of the Richmond and Danville Railroad at Danville and the North Carolina Railroad at Greensboro. This stretch of road—known as the Piedmont Railroad—was necessary to afford an interior parallel to the easily threatened trunk line along the coast. Engineer officers were in charge of it from the reconnaissances until the completion of the line in 1864—and it was the only one of the gaps that was completely closed. It proved of paramount service in bringing up supplies to the hard pressed forces in front of Richmond; being opened to traffic, fortunately, just before the coast line was cut above Wilmington.

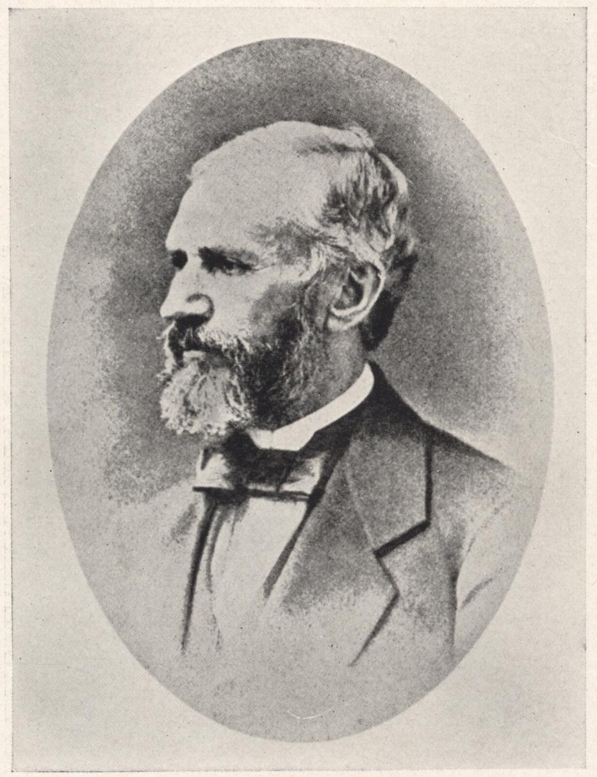
Courtesy of Geo. S. Cook

Interior View of Fort Sumter

The military director of railroads was attached to the Quartermaster-General's Department; but the Bureau of Engineers was called upon to make repairs to lines injured in the progress of the war. This work was necessarily very imperfectly done. The lines destroyed in Georgia by Sherman were repaired by the Engineers; but the railroad officials after the war were very outspoken in condemnation of the makeshift character of the work.

Rails were a very scarce article in the South and there was much competition between the Army and Navy for surplus supplies. To say surplus supplies is really misleading, for there was no such thing. To get rail to be rerolled into armour plate, or to rebuild a destroyed line, or to remelt for ordnance purposes meant that side tracks or branch roads had to be dismantled. Of course, the Bureau of Nitre and Mining was not standing idle; but the demand far exceeded the supply that could be made available by the combined processes of metallurgy and sabotage. Early in 1863, a joint Army and Navy Commission was appointed to determine what railroads could best be despoiled of rail; and, in 1864, an Army commission of three engineer officers was appointed to collect and distribute railroad iron. The latter commission was also charged, "with the duplication of railroad bridges and the repair and reconstruction of railroads injured or destroyed by the enemy and judged necessary for the transportation of troops and supplies."

On February 11, 1865, the Chief of Engineers submitted to the War Department his recommendation for a general program of railroad construction and rehabilitation calling for an appropriation of $21,000,000. The Secretary of War concurred in the recommendations, and the House of Representatives passed Bill No. 410 to make the requested appropriations. On March 14, the bill went to the Senate; but that body had taken no action on it when the Confederate Congress adjourned on March 18, 1865, *sine die.*



Major General Jeremy F. Gilmer, Chief of Engineers

In the early part of the war the signal service was generally performed by the Engineers. Captain Edward P. Alexander, C. E., before the war had made a special study of the Myer signal system upon assignment by the Chief of Engineers, United States Army. When he became General Beauregard's engineer and signal officer in 1861, he instituted a signal school; and many of his students later became officers in the Signal Corps, which was authorized under an Act of April 19, 1862. This Act directed that the Signal Corps be attached either to the Adjutant and Inspector General's Office or to the Bureau of Engineers. The Secretary of War assigned it to the former department.

The Nitre Bureau, later called the Nitre and Mining Bureau, was organized by a Provisional engineer officer, Captain Isaac M. St. John, who was promoted to be a major of artillery and made first superintendent. The Bureau was created by an act of April 11, 1862, and was placed under the general supervision of the Chief of Ordnance. On June 9, 1864, the Nitre and Mining Bureau was established as an independent bureau of the War Department, and its officers were commissioned in a separate Nitre and Mining Corps with the same pay and allowances as officers of Engineers. St. John was promoted to be colonel in this corps and became chief of the bureau.

Towards the end of the war the merit of this provisional engineer received further recognition, and Colonel St. John was made Commissary-General of Subsistence with the rank of a brigadier-general in the Provisional Army.

Submarine and torpedo work was engaged in by both the Army and the Navy, in neither of which was there an independent bureau or service charged with these duties. No money for torpedo activities is expressly provided in the army appropriations; but in the naval appropriations special sums were allotted to the construction of submarine batteries beginning with $50,000 in 1861 and reaching $350,000 in 1864. However, much of the engineer funds were expended on torpedo work, as the correspondence of the engineer offices at the several seaports shows. At Charleston the Bureau of Engineers maintained a laboratory for the manufacture of torpedoes and submarine tubes and fuses, employing an average of about forty men under the charge of a captain of the Provisional Engineers. From this depot, torpedoes, both contact and electrical, were distributed to the district engineers from Florida to Virginia. Captains Francis D. Lee, M. M. Gray, and E. P. Bryan were successively in charge of the torpedo work at Charleston. Captain Lee invented the spar repeating torpedo for use on vessels; and designed a torpedo boat which has been declared by Major John Johnson, C. E., P. A. C. S., in his admirable memoirs on *The Defenses of Charleston Harbor* (Charleston: Walker, Evans, Cogswell Co., 1892) to be "the real precursor of the boats now [1889] universally adopted in the navies of the world." The Navy was also engaged on submarine defenses in Charleston Harbor; and there naturally arose some antagonism, which went all the way up to the commanding general and the commodore and to the departments at Richmond. General Beauregard thought very highly of Lee's proposed torpedo ram, and endeavored to have the building of heavy ironclads at Charleston curtailed. He was unsuccessful in getting either the Navy or the War Department to take up Lee's torpedo boat idea. The general said that one torpedo was worth five 10-inch Columbiads. At length he succeeded in getting an appropriation of $50,000 from the State of South Carolina; and purchased a stoutly built and very fast steamer to be remodeled and covered with protective armour. The appropriations ran out before the vessel was finished, and she was laid up until the end of the war to the unending vexation of General Beauregard. From all the evidence that can be gathered, Captain Lee's design was sound, and if it had been consumated he would have been ranked as a pioneer in naval architecture.

Some thirty or more Union vessels were destroyed by Confederate submarine defenses, a large part of which were installed and operated by the Engineers. The U. S. Monitor *Patapsco* ran upon one of the engineer mines on the night of January 15, 1864, off Fort Sumter and went down immediately carrying two-thirds of her crew with her.

Brigadier-General Gabriel J. Rains, an infantry officer and one time chief of the Conscription Bureau, was an inventor of submarine appliances. In 1864, he became superintendent of the "Torpedo Bureau", an office which was not authorized by an act of Congress and which does not appear in the War Departments's list of bureaus prepared on December 16, 1864. This omission is difficult to understand in view of the fact that other offices unauthorized as independent bureaus, such as the Army Intelligence Office, are listed. It is certain that General Rains had some officers in the field. One F. S. Barrett, who signed himself "Second Lieutenant, in charge of torpedoes," reported the battle of Mobile Bay to the Headquarters, Torpedo Bureau, Richmond, Virginia, under date of August 20, 1864. In this report it is apparent that there had been some conflict between himself and the District Engineer, Lieutenant-Colonel Victor von Sheliha, over the placing of torpedoes, and the impression is left that if there had been no engineer interferences the outcome of the battle would have been different. The report went from the Torpedo Bureau to the President, who sent it to the Chief of Staff (General Bragg), who in turn sent it to the commanding general (Major-General Dabney H. Maury) at Mobile. The latter's endorsement does not bear out the inferences of Lieutenant Barrett.

To coördinate the activities of submarine warfare, laboratory and field, the organization of a bureau of polytechnics, with a corps patterned on the Engineers, was discussed at the 4th Session of the 1st Congress. The bill passed the Senate on February 15, 1864; but failed in the House of Representatives.

Regulations

The act of March 6, 1861, creating the permanent military establishment adopted the Regulations of the United States Army for the government of the Confederate States Army. The only changes, save the word, United to Confederate, were in those paragraphs relating to brevets. But during the course of the war numerous changes were made. The original paragraphs governing the Engineers had not been drawn with the extensive use of engineer troops in mind. Consequently, in 1863, with the advent of engineer regiments, it became expedient to define more fully the duties of engineer officers and officers of engineer troops.

Under the Articles of War, No. 63, and Army Regulations Nos. 11 and 366, the officers of the Corps of Engineers constituted an élite corps and were not expected to do troop duty: "being generally confined to the most elevated branch of military science, they are not to assume, nor are they subject to be ordered on any duty beyond the line of their immediate profession, except by the special order of the President of the Confederate States." Following those provisions a clear plane of cleavage was established between the officers of the Corps and those of engineer troops. When Corps officers and troop officers were both present, the senior officer controlled the situation in all points of plan and procedure; but no Corps officer was allowed to exercise superior rank in respect to the troops.

The duties of the Corps of Engineers were set forth in General Orders, No. 90, Adjutant and Inspector General's Office, June 26, 1863, as follows:

> To make reconnaissances and surveys of the sections of country occupied by our forces, and as far as possible of the country held by the enemy, embracing all the information that can be obtained in reference to roads, bridges, fords, topographical and military features, the character and dimensions of water courses, the practicability of constructing fixed and floating bridges, the extent of wooded and cleared lands, and the capacity of the country to supply the general wants of the army; to make detailed examinations and surveys of positions to be occupied for defensive purposes; to select the sites, and form plans, projects, and estimates for all military works, defensive and offensive, viz, field forts, batteries, rifle-pits, lines of infantry cover, military trenches, parallels, saps, mines, and other works of attack and siege; and also works for obstructing rivers and harbors; to prepare such maps and plans as will give a full knowledge of the ground and proposed works, and submit the same to the commanding general for his information and consideration, and forward, through the proper channels, copies of all reports, memoirs, estimates, plans, drawings, and models relating to the duties above enumerated to the Engineer Bureau, at Richmond.
>
> Officers of engineers will not assume nor be ordered on any duty beyond the line of their immediate profession, except by special order of the President. In the operations of the armies of the Confederate States, all that appertains to the science of civil or military engineering will be assigned by commanders to the officers of engineers serving with their forces; and with them will rest the responsibility of a proper execution of the works. The labor will be performed, if possible, by details of troops commanded by their own officers; in other cases, by hired labor under the control of overseers employed by the engineer officers.
>
> Officers of engineers will not be required to give other supervision to the fatigue parties or laborers employed in the construction of works than is necessary to indicate, in a clear and distinct manner to those directing the labor, their plans and the character of the work to be done.
>
> The senior officer of engineers serving with a commanding general in the field will transmit to the Engineer Bureau at Richmond the reports, plans, and journals called for by paragraph 478, Army Regulations.

The duties of engineer troops were prescribed in General Orders, No. 104, July 28, 1863:

> On the march engineer troops will serve as pioneers, constructing and repairing roads and bridges, and removing impediments to the advance of our forces, or delaying the enemy, by breaking up roads, destroying bridges, and otherwise obstructing his communications. They will also be employed in making rapid reconnaissances and surveys of the country occupied or marched over by the army; preparing sketches and maps of the roads and topographical features; laying out camps, and intrenching military positions. During battle they will be held in reserve, and used as circumstances may demand, either in their special duties, or as infantry. Under the command of their officers they may be employed in the construction of ovens for baking bread, and other works requiring mechanical skill, but not on mere police duty, or the like, unless connected immediately with their own organization; nor are they to be employed altogether on mere fatigue service; but once instructed in the duties of the engineer soldier, they will be frequently employed in laying out works, and also in aiding and directing the labors of other troops detailed for their construction.

Richmond after the Evacuation

Courtesy of Geo. S. Cook

The Confederate Engineers

William M. Robinson, Jr.

Major, Corps of Engineers Reserve

"I HAVE enjoyed perfect health all this campaign in Georgia. But I have been nearly baked by the sun, and eaten up by the mosquitoes, sand flies and dog fleas in camp—only think of having forty-one dogs and puppies in one battalion, and occupying scarcely an acre of ground!"

This commentary on the life of a young Engineer officer was written at Causton's Bluff, below Savannah, on June 7, 1862, in a letter to his father and sister—who were enjoying the salubrity of the Carolina pine country. Shortly afterwards he was transferred to the Confederate States Engineer Office at Charleston, where he was mostly engaged on routine work. Then came a reconnoitering detail on James Island. Of this adventure he wrote to the home folks, July 19, 1862:

> The evacuation of the Island by the enemy must have been going on while I was writing to R. It was their custom to make their bands play almost the entire time to drown the noises of packing up and embarking and our pickets would come in day after day reporting the incessant music—which could not be explained to mean an evacuation positively or a reinforcement. Perhaps it was as well, however, that we were kept in doubt, for had we been tempted to attack them during their evacuation, the fire of their gunboats, and the strong position they had in their entrenched camps, would have made it extremely difficult for us to have secured any plunder. Letting well enough alone, I think we have reason to be satisfied with the campaign on James Island.
>
> The reconnoissance . . . . was ordered directly from Richmond to ascertain the practicability of re-occupying Battery and Coles Islands. The report was altogether unfavorable, as the enemy since leaving the Island have had their gunboats stationed in the Stono to watch against this very movement. Capt. Echols of the Engineers was ordered to make it and I to accompany him. We took horses from the city last Saturday afternoon, and spending the night at Secessionville, started out the next morning, Sunday, in company with Colonel Stevens and Smith and a trusty scout. We visited first the enemy's most advanced battery, a mile from Secessionville, passing over the battle ground of the 16th of June, then the Legare house (the scene of the skirmish of the 3rd of June), then the enemy's camp at the S. E. angle of James Island. This was as near to the Battery I as we could get: the bridges and causeways to both it and Coles Island being impassable, burnt or broken by the enemy. Here we peeped through the bushes at the gunboats little over a quarter of a mile distant and ascertained the impracticability—as long as they were there—of regaining any of our abandoned positions. Continuing our ride, we visited their other camp at Grimball's, two miles above on the Stono. This had been strongly fortified and with the lower camps must have contained a force of eight thousand to ten thousand troops. On our way back, about a mile from Grimball's, we passed through the piece of woods where the fight of the 10th of June took place and saw the trees riddled with bullets and cut and split in every direction by the heavy artillery from the gunboats. I brought back nothing but an old envelope picked up at the lower camp. There were all sorts of impracticable relics scattered about, such as *old clothes,* some quite good, stuffed sentinels, thousands of good cracker boxes scattered in every direction, a first-rate arm chair, several sign boards (more or less witty) . . . . *Jeff Davis taking flight* was illustrated by a large and well executed sketch of a man borne aloft by an eagle holding him by the seat of his breeches.

On August 26, 1862, he wrote that he had been placed

> in charge of work going on at Fort Ripley or Middle Ground Battery, Charleston Harbor. It is a little fort but has given sights of trouble since [Brigadier General Roswell S.] Ripley projected and located it. It was not strong enough; and, on R's leaving, [Major General John C.] Pemberton ordered it to be remodeled. The position is an important one; but as it is to mount only five big guns, it will not be a second Sumter. The gunboats [Confederate] are progressing slowly as usual, and although both are launched, enough remains to be done to keep them until the first of October before completion. The Navy people brag exceedingly on their boat, the *Palmetto State,* and the ladies still more on theirs, the *Chicora,* the fact being they are both fine boats. I saw the *Chicora* launched last Saturday evening before an immense crowd. [The *Chicora* was built with funds raised by the ladies of Charleston.]
>
> There are at present six British steamers in port, all having run the blockade in perhaps the last month or six weeks. Two of them recently arrived at quarantine with yellow fever on board, but no pains will be spared to keep it out of the city or camps. Don't let any reports of fever being in the city get about where you are, for there is not a particle of truth in them. [However, yellow fever later got into Charleston, and the Chief Engineer of the Department of South Carolina, Georgia, and Florida, Colonel D. B. Harris, died of it in October, 1864.]

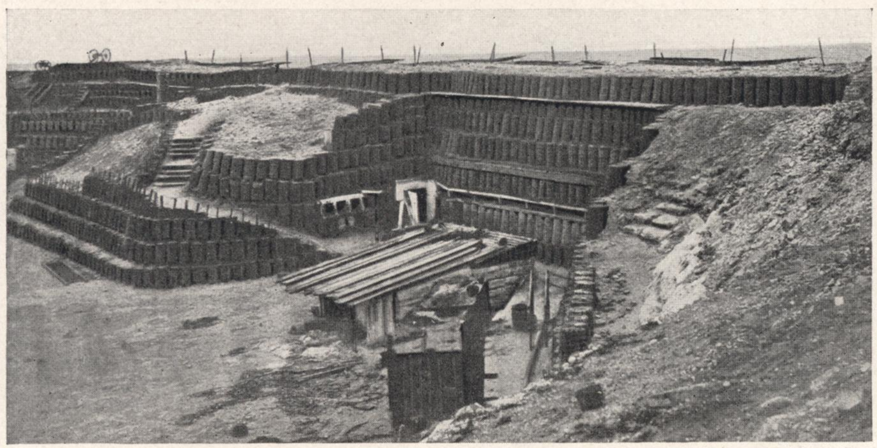
After a tour of duty in "that tar, pitch, and turpentine state" of North Carolina, in the Cape Fear District, and one in the Adams Run and Caw-Caw Swamp country of South Carolina, he returned to the defenses of Charleston; and found (March 2, 1863) that the "works of defence are going on briskly but labour and tools are scarce."

While Charleston had been in a virtual state of siege since early in 1862, the unremitting *Siege of Charleston* did not begin until July, 1863. After several days of preliminary bombardment, the real battering began on August 17, 1863; and the next day, Lieutenant Jones wrote to his brother from Fort Sumter:

> The firing yesterday was severe and destructive within and without the Fort, nor from the unprecedented range, 3¼ miles, could we return the fire of any of our enemies except the fleet. We did very well on them and so far today they have not annoyed us as much as yesterday. But the Fort was never built to resist such ordnance as 200-pound Yankee Parrotts.

On August 24, 1863, Major General Quincy A. Gillmore, United States Volunteers, reported to Washington, "the practical demolition of Fort Sumter as the result of our seven days' bombardment of that work." The Confederate artillery officers were of the same mind; but the Engineers remembered their motto, "*Essayons*"—and they not only tried but did restore the condition of the fort. On the same day that the Federal commander wrote his optimistic report, General Beauregard caused a Board to inspect the fort and respond to four questions. The Board was composed of the Chief of Engineers, Colonel Gilmer, the Department Engineer, Lieutenant Colonel Harris, and the engineer-in-charge, Lieutenant Johnson, on the part of the engineers; and for the artillery, Colonel Rhett, the Department Chief of Artillery, and Major Blanding, and Captain Harleston, of the First South Carolina Artillery.

To the first proposition, "The present offensive condition of the fort", young Johnson replied: "The present offensive condition of the fort is very limited; one very fine gun (11-inch) capable of being fired with advantage; two others (10-inch) at disadvantage, in consequence of shattered condition of parapet." His engineer superiors agreed with him; but the consensus of the artillery was that "The offensive condition of the fort is very nearly destroyed".

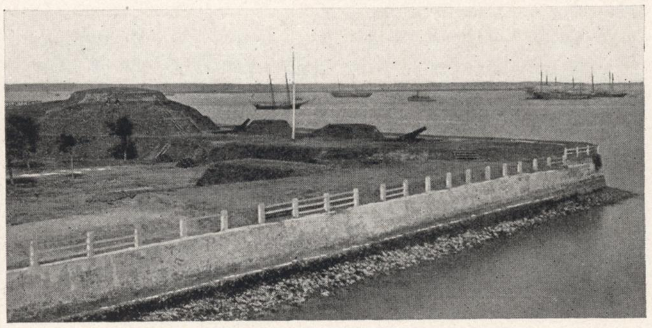

Courtesy of Geo. S. Cook

An Interior View of Fort Sumter

To the second proposition, "Can offensive power still be given to these guns by additional cover and change of location?" Johnson responded: "Yes; by sandbag épaulement and timber platforms in rear of and between present platforms." The engineers were again in agreement, but the artillery officers believed the proposition to be impracticable.

The "Capacity of the fort as a defensive position, in its present condition, against a barge attack, and the number of men needed," was the next question propounded. All agreed that the fort could be held against landing parties by a force of three to four hundred men.

The fourth proposition was: "Power of the fort to preserve its present defensive condition against probable attack." The opinions as to the time that the fort could hold out against the combined attacks of the fleet and the Parrott and mortar batteries varied from thirty-six hours by Lieutenant Johnson to two or three hours by Colonel Rhett—excepting Colonel Gilmer, who said: "The fort will remain tenable against any probable attack for many days if the Engineer officers be supplied with the labor and material necessary to reinforce points comparatively weak."


Courtesy of Geo. S. Cook

The South Battery at Charleston

When Colonel Gilmer transmitted the proceedings of the Board to General Beauregard, he reported that "there are many elements of defense within the fort, in its present shattered condition, which if properly used may enable a resolute garrison to hold it for many days." He took occasion to rap the artillery officers by suggesting that the question of its abandonment, whenever it might arise, "should be determined by the commanding general, and not left to the discretion of the commander of the fort." And, the commanding general, being also brought up in the school of *Essayons*, concurred in the recommendations of the Chief of Engineers.

In due course Lieutenant Johnson was rewarded with a captaincy, C. E., P. A. C. S., and was allowed a resting spell in Charleston. Then, on November 6, 1863, he wrote home:

> I write in a spare moment to let you know that after having had a nice quiet time, comparatively speaking, for now nearly six weeks, I am to go on duty this evening once more on Fort Sumter, relieving Capt. Champneys, who I suppose wants and needs some rest. The fire upon the fort has not been heavy this week, and the bombproofs are unhurt; and, although the height of the mass of the fort is *now diminishing* visibly on the sides away

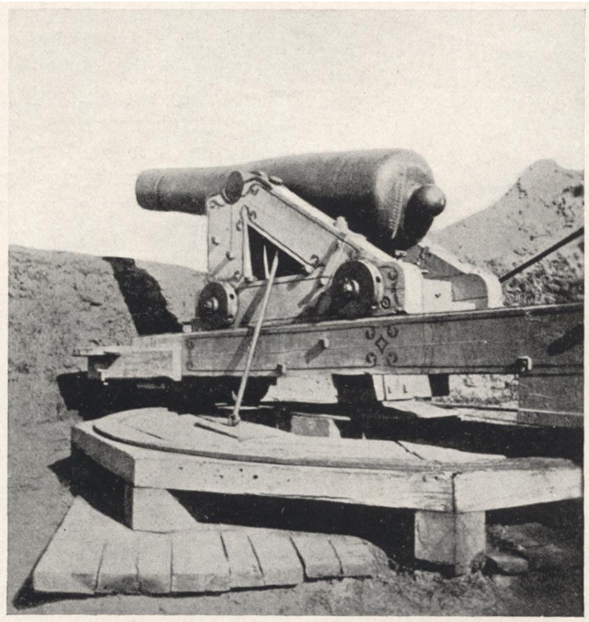
> from the city, when it gets down to the lower casements, it will have become so thick from accumulated debris as to resist further battering. I don't apprehend being run out by the big guns, the chief anxiety is henceforth on account of exposure to assault from barges at night.
>
> Remember me all in your prayers from spiritual and temporal dangers.

After about two weeks as engineer-in-charge, Captain Johnson wrote his family of the conditions in the fort:

> Since last writing I have been much annoyed, though not at all prevented from doing duty, by a severe cold, sore throat, et cetera, which held on for four days and has only today been at last broken . . . . The necessity such as mine of passing backwards and forwards all night, particularly from the hot, close and sometimes stinking quarters, passages, and bomb-proofs into the cool, pure night air, sometimes windy and cold on the ramparts—is trying to the strongest constitutions.
>
> All our nights are vigilant—some, anxious. These moonlight ones are a great blessing to us—it is only after the moon goes down that matters grow wary. Last night between 2 and 6 A. M. we had four distinct alarms from the enemy's guard boats or others approaching within 3 to 400 yards of the sea face of the fort. All hands out each time expecting a fight. . . .
>
> The garrison is supplied plentifully with cooked beef, bacon and wheat bread, which are good too of their kind. Officers can buy these, together with coffee and sugar, as they want them, so you see there is no danger of starving. We enjoy potatoes exceedingly when such are sent by friends of the mess.

On December 4, 1863, Captain Johnson wrote:

> Nothing unusual down here I am happy to say. The firing has been resumed at long intervals tonight. The day work is chiefly battering the S. W. angle without any great danger except to sand bomb-proof cover over stairway, which is highly important and requires every night repairing until a late hour to put it in condition for the next day's fire. Elsewhere, the fort is in the best condition to be expected under the circumstances.



Courtesy of J. P. Stratton

The Swamp Angel

During the next eight months the story remained about the same; and on July 25, 1864:

> Enemy's fire which for some days past had slackened grew brisker, today being the 19th day of present bombardment, but no casualties of any account since the 20th. As to effects, damage and so on, they are rather prospective than anything actual and severe—yet enough to keep working parties going from noon every day to 4 A. M. every morning. I understand there have been some very exaggerated rumors in town about damage and casualties here. The garrison troops work from 12 to 6 P. M., about eighty men in two reliefs; the negroes, one hundred and sixty, and white workmen, fifteen, from 6 P. M. to 4 A. M. But for this active repairing matters might have taken an annoying turn; as it is we owe a great deal to enemy's getting tired of battering particular places and changing to others—it gives time and advantages.

Three days after writing this letter, Captain Johnson, while on a tour of inspection just before daylight, was severely wounded by a fragment of a mortar shell striking him on the top of the head. He had been on duty in the fort continuously for eight months and twenty days. He was now relieved by Second Lieutenant Edwin J. White, C. E., P. A. C. S., who remained in the fort until its evacuation—February 18, 1865, the five hundred and sixty-seventh day of the *Siege of Charleston.* In recognition of his services, Captain Johnson was promoted to major, to take rank from October 19, 1864.

Pay and Allowances

The Engineers were the highest branch of the service, and accordingly their pay scale was the highest in the Army. Officers of Cavalry and of the General Staff received the same pay as the corresponding grades in the Engineers; but the pay of the engineer enlisted men was not equalled except in the Ordnance. Engineer sergeants (who ranked with master armorers, master carriage-makers and master blacksmiths) were paid $34 a month, whereas sergeants of the line got $17 and quartermaster sergeants and sergeants major $21. Engineer corporals were paid $20 but line corporals only $13. Artificers or engineer privates first class received $17, but line privates first class received $4 less. Laborers or engineer privates rated $13, but privates of cavalry only $12 and privates of infantry and artillery $11. Even engineer musicians received one dollar more than line musicians, that is, $13 intsead of $12. But all head cooks were paid $20 and assistant cooks $15. In June, 1864, the enlisted pay was raised $7 a month, uniformly, in all grades and arms. The base pay of engineer officers was: colonel, $210 a month; lieutenant-colonel, $185; major, $162; captain, $140; first lieutenant, $100; and second lieutenant, $90. Lieutenants assigned to duty as adjutants received $10 a month extra.

Lieutenants were allowed to draw forage (commuted at $8 a month) for two private mounts, and captains and field officers for three mounts; but towards the end of the war the privilege of keeping more than one horse was withdrawn from officers not actually on service in the field. Mileage was fixed at 10 cents during the first part of the war. Travel allowance was later changed to Government transportation plus $10 per diem; but engineer officers charged with department or district work were allowed their actual expenses. Longevity was confined to the Regular establishment, and was at the rate of $9 a month for each five-year period, including prior service in the United States Army. A Regular Army officer holding a higher emergency commission could elect to be paid according to his permanent rank with the longevity increment or according to his temporary rank without it. An act of February 17, 1864, entitled each officer on duty in the field to purchase one ration at cost. The value of the ration rose from $1.00 in January, 1864, to $2.50 in August; but the estimates of the Commissary-General of Subsistence, made on October 4, 1864, anticipated the cost of the ration for the first six months of 1865 to be $2.02375. In addition to the subsistence ration, a ration of tobacco was issued once a month, the 1865 value of which was $2.00.

The composition and cost of the 1865 ration was as follows:

Meal	0.75	lb. @ $5 a bushel	0.075
Flour	0.45	lb. @ 50c a pound	0.225
Salt	0.02	qt. @ $5 a bushel	0.003125
Beans	0.04	qt. @ $6 a bushel	0.0075
Rice	0.05	lb. @ 30c a pound	0.015
Coffee	0.06	lb. @ $5 a pound	0.30
Sugar	0.12	lb. @ $3 a pound	0.36
Vinegar	0.04	qt. @ $2.50 a gallon	0.025
Candles	0.015	lb. @ $3.00 a pound	0.045
Soap	0.04	lb. @ $1.00 a pound	0.04
Bacon	0.2	lb. @ $3.00 a pound	0.60
Beef	0.25	lb. @ 75c a pound	0.1875
Sorghum	0.45	gills @ $10 a gallon	0.140625
		Total	$2.023750

The only change in the official make-up of the ration during the progress of the war consisted in substituting sorghum for a portion of the meat element. Whiskey issues were confined to the hospitals.

When the cost of clothing became sky high, Congress authorized (February 17, 1864) the sale of surplus quartermaster stocks to officers in quantities not to exceed one complete suit per annum. This yearly allowance was held by the Quartermaster-General to consist of "a coat and pair of pants or material (four yards, double width), and trimmings therefor, one pair of shoes, one hat or cap, three pair of drawers, three cotton shirts, two flannel shirts, and four pair of socks." An act of January 16, 1865, directed the free issue of one such outfit once a year to each officer on duty in the field, below the grade of brigadier-general; but no issues to officers were authorized until the requirements of the enlisted personnel had been met. This probably left very little to be sold to officers on garrison or office duty. In January, 1865, the Quartermaster price of uniform cloth was $20 a yard, double width.

Uniforms

The uniform and dress of the Confederate Army was announced in General Orders, No. 9, Adjutant and Inspector General's Office, dated Richmond, Virginia, June 6, 1861, supplemented by General Orders, No. 4, 1862. These uniform regulations were reprinted in the back of the *Army Regulations*, First Authorized Edition (Richmond; West and Johnson, 145 Main Street, 1862); and may be found in the *Official Records*, series IV, volume 1, pages 369-373 and 879-880. Sketches showing some of the uniforms of the Union and Confederate Armies may be found on plates 172-175 of the atlas accompanying the *Official Records*.

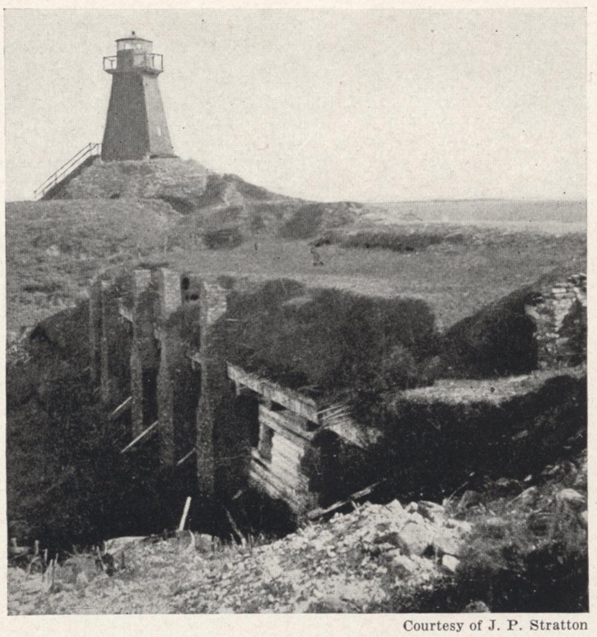
Apart from the cadet grey cloth of the coat and the difference in headgear, the most notable difference in the uniforms of the two armies was in the matter of rank and branch insignia. The metal ornaments, shoulder straps, and epaulettes, so familiar in the United States Army were replaced by bars and knots of lace and colored patches and accessories. The branch designation by colored elements was a very complicated affair, for many of the colors were common to more than one corps. For instance, if one noticed that the officer wore a red sash, it might be as well supposed that he was an Infantryman, Artilleryman, or member of the General Staff except the Medical Corps, as an Engineer. Dark blue trousers with a broad stripe of gold along the outer seam and buff facings on the tunic would narrow the officers' corps down to the Engineers or the General Staff less the Medical Corps. If the officer wore buff and a cocked hat, it was a safe bet that he was either a general or member of one of the General Staff Corps or the Corps of Engineers. So if one wanted really to be sure that the officer was an Engineer, he had to get up close enough to distinguish the German *E* on his coat buttons. The buttons of line officers bore the initial of their branch, in the English text; and those of generals and officers of the General Staff, an eagle surrounded by stars.

To recognize an engineer soldier was easy, however, as there were no enlisted men in the other staff corps to share the buff facings and his buff collar and cuffs. The use of the branch color for the collar and cuffs of a soldier strikingly differentiated his coat from that of an officer, whose collar and cuffs were plain grey—though this distinction was not always adhered to, as many old photographs of officers show, perhaps from ignorance of the regulations, but more likely from a flair for color. The trousers for enlisted men (and line officers) were sky blue and were made loose "to spread well over the foot." The chevrons of non-commissioned officers were made of worsted in the branch color. Sergeants were allowed to wear worsted sashes and cotton braid on the trousers in the same color as their officers. The coat buttons carried the regimental numerals.

The standing collar of the Confederate coat stood open thirty degrees at the neck. On each side of the opening, gold stripes parallel to the slant edge indicated the grades of junior officers, and stars the field officers. That is, one stripe indicated a second lieutenant and three stars a full colonel. When the colonel became a general, he simply enclosed the stars in a wreath. Rank was further indicated by sleeve knots of five loops in narrow gold braid. Subalterns wore one strand, captains two, field officers three, and generals four. There was no distinction between a general of brigade and the general-in-chief.

The headgear was frankly adopted from the French Army; being a chapeau, or cocked hat, for the generals and staff corps, and a kepi, or forage cap, for all other officers and men. The band of the kepi was dark blue but the color of the sides and crown varied with the branch. For the line personnel, the branch color obtained, that is, red for artillery, light blue for infantry, and yellow for cavalry; but for all others, dark blue. For officers, gold braid extended from the band to the crown on the front, back and both sides, and encircled the crown, in the same number of strands as in the sleeve knots. As a protection to the neck, a havelock or neck apron of white duck or linen was authorized for wear in hot weather and one of oilskin in wet weather.

The stocks or cravats were black. The overcoats had stand-up collars and capes. Spurs were of gilt or yellow metal. Boots were either ankle or Jefferson. Sword belts and slings were plain black leather; except, for generals, Russian leather with gold embroidery. The sword-belt plate was gilt, with bright edges, bearing the coat of arms of the Confederate States encircled by a silver wreath of laurel.


Courtesy of J. P. Stratton

Confederate Dugouts

I do not know whether the Engineer officers were supposed to be bigger men than their brothers of the Infantry, Artillery, and the Cavalry; but the buttons on their coats were one inch in diameter, being one-eighth inch larger than those of the line officers. It really must be so; for, as we go up in the scale of preference, we find that it took eight buttons to fasten up the tunic of a general, while seven were considered sufficient for a lower officer or an enlisted man.

Engineer Records

In the delightful *Reminiscences of the Confederate Engineer Service,* by Colonel T. M. R. Talcott, First Engineer Regiment, which appeared in the *Photographic History of the Civil War* (New York —The Review of Reviews Co., 1911), the writer said: "The account of the services rendered to the Southern Confederacy by its engineers must be largely, if not wholly, from memory, owing to the loss of records pertaining to this branch of the Confederate military service." As a matter of fact, in the excellent compilation of the *Official Records of the Union and Confederate Armies* (Government Printing Office, 1881-1901) a very large number of the reports, journals, plans, maps, and so forth, which were required by Army Regulations to be forwarded to the Engineer Bureau, have been collected and printed. A rather minute history of Confederate engineer operations might be prepared by one with the proper patience. *Patience,* I say, for the not altogether perfect manner of indexing the one hundred and twenty-eight books in the four series, together with the one thousand and six maps, plans, and sketches in the atlas folders, makes it necessary to cut and try many times when in search of facts where the names of the principal participants are not known. *The Calender of Confederate Papers,* prepared under the direction of the Confederate Memorial Literary Society, by Douglas Southall Freeman (Richmond: The Confederate Museum, 1908) reprints some interesting engineer records. Occasional sidelights on the engineer service appear in the *Official Records of the Union and Confederate Navies in the War of the Rebellion* (Government Printing Office, 1894-1927), particularly, in the matter of river and harbor work and defenses.

The laws relating to the engineer service may be found in the Statutes-at-large which were published by the Government printer in Richmond after each session of Congress, except, of course, the last one which ended in March, 1865. The *Journal of the Confederate Congress* which contains the nominations of the War Department, was printed by the United States Government Printing Office in Washington in 1904-1905, as Senate Document No. 234, 58th Congress, 2nd Session.

The reports and journals of the chief engineers of the districts, departments, and armies indicate unflagging industry and much resourcefulness; and make rather fascinating reading.

The Last Days

When the evacuation of the Richmond-Petersburg line became inevitable, in March, 1865, Colonel Talcott, 1st Engineers, sent Captain G. W. Robertson's ponton train to South Boston on the Dan River to prepare for the retreat. The nearer stream crossings had already been put in order. The main body of the engineer troops was thrown into the trenches during the withdrawal of the infantry and was the last to leave Petersburg. They destroyed the bridges behind them, fought rear guard engagements, rushed ahead to get wagon trains out of the mud, felled timber and strengthened old bridges, and were simply everywhere in that rapid retreat which brought up sharp at Appomattox Court House.

In the meantime, the Confederate Government was fleeing southwards—including the President, the Chief of Engineers, the Treasury, and all the executive departments with their archives. General Lee had expected to make the Dan River his new line of defense, and the Government set-up at Danville. General Johnston with the Army of Tennessee was to join him from North Carolina. When Lee was cut off at Appomattox, the Government renewed its flight into North Carolina to gain the protection of Johnston. The tracks and bridges of the railroad were in bad condition. Animals, labor, and tools were necessary to open the line of retreat. These could only be had for gold. Accordingly, the Chief of Engineers, Major General Gilmer, requisitioned through channels $4,000 in gold, which in the hands of Major W. F. Foster, C. E., P. A. C. S., produced results; and the Government kept going—slowly. In North Carolina, Major Green with a part of the 3rd Engineers joined the party at

Catawba Bridge; and was ordered to precede the Government, opening up the route, by rail and by wagon, to Washington, Georgia. This was done, a ponton bridge being thrown across the Savannah River. Company F, Captain W. A. Ramsey, with full pioneer equipment, was left behind to take care of the immediate engineer needs of the Executive party. Captain George M. Helm, C. E., P. A. C. S., was named chief engineer on the President's staff. On every hand the expenditure of gold was required. There was no longer any faith in the greybacks of the Confederacy. Fortunately, there was several hundred thousand dollars in coin and Liverpool acceptances in the traveling Treasury. At first, the requisitions to meet the needs bore some semblance to regularity; but as the march continued, time was pressing, and difficulties became difficult and more difficult—and gold in sums from a few hundred to a few thousand dollars were handed out to this engineer officer or that one to pay for horses and mules, tools, labor, to be accounted for later. Upon arrival at Washington, the last Cabinet meeting was held. The President with a reduced personal staff, which included no engineer officers, turned towards the Trans-Mississippi to join the forces of General Kirby Smith. The Acting Treasurer burned the bonds and currency. The precious metal in the Treasury was parcelled out for public purposes, the bulk of the coin, $108, 322.90, going to a quartermaster major for the payment of troops in Georgia. The silver bullion was turned over to a commissary major to provide subsistence for the disintegrating forces in Georgia. To a naval officer $86,000 was given to be transported to the Confederate depository in Liverpool. To each of the President's staff $1,500 in gold was paid. When President Davis was captured no money was found on his person. The Acting Treasurer, Captain W. H. Clark, years later published his receipts for the final distribution of the funds at Washington. Unless the engineers got some of the quartermaster major's funds as back pay, they seem to have gotten nothing.

After War Careers

When the war was over, the Confederate Engineers, save a few who sought adventure in foreign lands, laid aside the profession of arms and turned to the task of rebuilding their broken country. Most of them entered railroad service as engineers or executives. General Beauregard became chief engineer of the New Orleans, Jackson and Great Northern Railroad, and Major General Smith, chief engineer of the Selma, Rome and Dalton Railroad. Brigadier General Alexander became president of the Central Railroad and Banking Company; and Major Green, 3d Engineers, became general manager of the Georgia Railroad. The latter had as his chief engineer Major Hamilton Wilkins, one of those engineers who had been appointed a second lieutenant in the line of the Regular Army and then detailed on engineer duty.

A few officers became college professors; as, Major General G. W. C. Lee, who headed the department of civil engineering at the Virginia Military Institute, and succeeded his father, General Robert E. Lee, as president of Washington and Lee University. General Boggs, after railroading for several years, became professor of mechanics at Virginia Polytechnic Institute. Other officers sought general engineering careers or turned to industry and commerce. As an instance of the former we find that Captain Harrod, of the 2d Engineers, re-entered private practice in New Orleans and rose to eminence, becoming a member of the Mississippi River Commission and a president (1897) of the American Society of Civil Engineers. The war "made a Christian" out of at least one Confederate engineer. Major John Johnson, a veteran of the siege of Charleston, turned to the Episcopal ministry and became rector of St. Philip's Church in that city.

Of the few engineers who looked to foreign lands for adventure and profit, Brigadier General Stevens may be mentioned. He went to Mexico and died in 1867, as engineer in charge of rail communications between Vera Cruz and Mexico City.

But a man I like to think of as a typical Confederate Engineer, or better still a typical American engineer, was Captain Henry Clay Derrick, Company D, 1st Engineers. Before the war Captain Derrick was an assistant engineer, United States Engineer Department. After the war he turned his talent, with untiring zeal, to the rehabilitation of the transportation system. Then when the war scars began to disappear and the South had regained some economic steadiness, he listened to that impulse which often comes to veterans of a great war, a desire to again "shout out your numbers loud and strong", as an artilleryman would say. In 1875, he accepted a commission as a lieutenant colonel of engineers in the Egyptian Army. He surveyed a military railroad from Messowah on the Red Sea to Bahr Reza in Abyssinia, and served in the disastrous campaign against King John of Abyssinia. He was decorated for gallantry in the field, Khedive Ismail bestowing upon him the Imperial Order of Medjidieh. After three years in foreign uniform he was ready to settle down again in the South to the less exciting business of engineering. He died in 1915, being survived in the American Society of Civil Engineers by two sons and one grandson.

"Colonel Derrick's professional career during his thirty-seven years of railroad service", reads his memoir in the *Transactions of the American Society of Civil Engineers* (volume LXXX, pages 2133-2134), "was typical of the life of the civil engineer in the United States during that period when railroad building was most active. The greater part of the profession was engaged in preliminary surveys, location, and construction, and as soon as a railroad was nearing completion they went to another. It was a hard but interesting life, useful to the country and to the nation, but it seldom led to fame or fortune for the individual. Colonel Derrick's retirement from active practice coincided with the discontinuance of active railroad construction in the United States. . . .

"In writing of Colonel Derrick's personality, those who knew him speak of him with affection and respect, dwelling especially on his modesty and simplicity, his courage, his highmindedness, and on the essential dignity of his character. . . . In social circles his keen wit and humor were always evident and delightful, and as a host he was the soul of gentility, courtesy, and hospitality."